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INSTITUTE

COLONY OF MAURITIUS

—

ANNUAL REPORT

OF THE DEPARTMENT OF AGRICULTURE FOR 1932

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COLONY OF MAURITIUS

—

ANNUAL REPORT

OF THE DEPARTMENT OF AGRICULTURE

FOR 1932

Department of Agriculture, Sugarcane Research Station and College of Agriculture.

STAFF

Director of Agriculture and Principal, College of Agriculture	... G. E. Bodkin, B. A., Dip. Agric. (Cantab).
Sugarcane Research Station:	
Senior Geneticist	... A. G. G. Hill, B.A., B. Agric. (Dublin), A.R.C. Sc. (Ireland).
Physiological Botanist ...	... H. Evans, Ph. D. (Wales).
Bio-Chemist ...	... N. Craig, M. Sc. (Durham)
Cane Breeding Officer ...	... A. de Sornay, I.A.C., Dip. Agric, (Mauritius).
Scientific Assistants ...	G. Mazery, Dip. Agric. (Mauritius). A. d'Emmerez de Charmoy. Dip. Agric. (Mauritius). P. Halais, Dip. Agric. (Mauritius).
Agricultural Division:	
Senior Agricultural Officer and Assistant Registrar, Co-operative Credit Societies... ...	... C. A. O'Connor.
Irrigation Officer ...	... E. Lesur.
Inspector, Co operative Credit Societies	... M. Burrenchobay.
Assistant Agricultural Officer	... A. Valasois, F. R. H. S., Cert. Hort. (Reading).
Assistant Agricultural Instructors	E. Bedsy, Dip. Agric. (Mauritius) G. Bauristhène, Dip. Agric. (Mauritius). A. North Coombes, B. Sc. (Reading), Dip. Agric. (Mauritius).
Overseers of Gardens and Plantations.	F. Leclerc, M. Valaythen, B. Emmanuel, D. Ramphul, C. Boolkah, T. Manrakhan, D. Kissoonah, I. Beeputh.
Botanical Division:	
Botanist and Mycologist	... E. F. S. Shepherd, B. S. A. (Mc. Gill).
Scientific Assistant ...	... G. Orian.
Plant Inspector ...	... J. Duhamel, Dip. Agric. (Mauritius).
Sugar Technological Division:	
Sugar Technologist ...	... L. Baissac, F.C.S.
Assistant Sugar Technologist	... R. Avice, A.R.T.C., Dip. Agric. (Mauritius).

Veterinary Division:

Veterinary Surgeon ...	... F. E. Lionnet, Ec. Vet. (Alfort).
Stock Inspector ...	... Y. Lefébure.
Assistant Stock Inspectors	E. Cartier. T. Rivalland. W. Haddon.

Entomological Division:

Assistant Entomologist	... A. Moutia, F.R.E.S., Dip. Agric. (Mauritius).
Scientic Assistant ...	... J. Vinson, Dip. Agric. (Mauritius).
Chief Phytalus Officer	... A. Delord.
Assistant Phytalus Officer	.. P. Regnard.

Chemical Division:

Assistant Chemist. ...	... R. Lincoln, M.A. (Cantab), Dip. Agric. (Mauritius).
Scientific Assistants ...	F. Berchon, Dip. Agric. (Mauritius) R. Rivalland.

Tobacco Division:

Government Tobacco Officer*	... G. Corbett.

Government Dairy:

Officer in charge of the Dairy	... Y. Lefébure.
Overseer	... S. Nunkoo.

Statistical Division:

Statistician ...	.. M. Kœnig, A. Inst. P.

Clerical Division:

Chief Clerk ...	... J. H. Nicolin.
Financial Clerk ...	... E. Emile.
Correspondence Clerk ...	... J. J. Laridon.
Clerks	... I. Félix & R. S. Buguth.
Store Clerk... ...	... R. Chang Kye.
Librarian	... G. H. Urruty.

Rodrigues:

Agricultural Superintendent	... R. Jauffret.
Overseer	... S. Oree.

COLLEGE OF AGRICULTURE

Principal	... G. E. Bodkin.
Registrar	... M. Kœnig.
Clerk	... E. Gérard.
Lecturers ...	L. Baissac, F. E. Lionnet, M. Koenig, E F. S. Shepherd, C. A. O'Connor, R. Lincoln, J. H. Nicolin, Y. Lefébure, R. Avice, A. Moutia, F. Berchon, A. North Coombes.

* Is also Secretary to the Government Tobacco Board and Officer in charge Government Tobacco Warehouse.

Annual Report of the Department of Agriculture for 1932

No. 967/32

THE HONOURABLE THE COLONIAL SECRETARY,

I have the honour to submit the report on the agricultural conditions of the Colony and the work of the Department of Agriculture for the year 1932.

PART I

GENERAL REPORT ON THE WORK OF THE DEPARTMENT OF AGRICULTURE AND THE AGRICULTURAL CONDITIONS OF THE COLONY DURING 1932

Staff.

Mr. A. G. G. Hill continued to act as Director up till March 3rd, the date of my arrival in Mauritius.

Mr. N. Craig, Bio-Chemist, Sugarcane Research Station, proceeded to England on leave of absence on 20th July.

Dr. H. Evans was appointed Physiological Botanist to the Sugarcane Research Station and assumed duty on 31st March.

Messrs. A. Moutia, Assistant Entomologist, and P. Regnard, Phytalus Officer, proceeded to Madagascar on a special mission for the search of new parasites for *Phytalus Smithi*, Arrow. They left the Colony on 15th April and returned on 18th July.

Mr. J. H. Nicolin, Acting Chief Clerk, was confirmed in his appointment on 1st July.

Mr. J. Vinson, Scientific Assistant, was placed in charge of the Entomological Division during Mr. Moutia's absence in Madagascar.

Mr I. Félix, Clerk, returned from European leave of absence on 29th April.

Mr. F. Berchon, Scientific Assistant, Chemical Division, was granted leave of absence and proceeded to Europe on 24th October.

Mr. A. North Coombes was appointed Assistant Agricultural Instructor in the place of Mr. J. Duhamel on 1st December.

Mr. J. Duhamel, Assistant Agricultural Instructor, was appointed Plant Inspector on 1st July.

Mr. P. Regnard was appointed to the post of Second Phytalus Officer on 21st August.

Mr. A. Villars, Assistant Overseer Royal Botanical Gardens, unfortunately died on the 24th August. Consequent on the death of this officer, Mr. I. Beeputh was appointed Overseer on 1st September.

Mr. G. H. Urruty, Librarian, who was acting as Assistant Master, Royal College, reverted to his substantive appointment on 15th January.

I wish to record here my appreciation of the assistance which I have received from the staff of the Department during the period under review.

Stations.

The headquarters, offices and laboratories of the Department of Agriculture are located at Réduit some 1,000 feet above sea level. The following principal areas of land are utilised and controlled by the Department for experimental field work in all its various phases:— Réduit, 22.78 arpents; Barkly (altitude 700 feet) 13.7 arpents; Mon

Plaisir, Pamplemousses (altitude 220 feet) 9.62 arpents; La Ferme (altitude 420 feet) 12·82 arpents. A number of minor areas in different parts of the Island are leased or occupied rent free for experimental work principally in connection with sugar cane and tobacco. The local "arpent" is slightly greater than the English acre.

EXPENDITURE AND REVENUE*

EXPENDITURE

	Rs. cs.
Department of Agriculture :—	
Personal Emoluments	183,250.56
Maintenance of Gardens	6,654.76
General Services	1,291.78
Prevention of Plant Diseases and Pests ...	1,996.97
Prevention of Animal Diseases	1,705.68
Upkeep of Stock	777.72
Travelling Expenses	7,487.45
Maintenance of Experiment Stations ...	14,023.88
Subvention to "Société Horticole"	500.00
Apparatus, Chemicals and Laboratory Supplies ...	2,486.58
Nursery for the distribution of Economic Plants ...	2,705.80
Destruction of Phytalus Smithi	73,649.46
Services rendered by the Railways	4,178.24
Contribution to "La Revue Agricole" ...	500.00
Telephone charges	545.11
Typewriter	266.15
Registration of Agricultural Chemists ...	125.00
Upkeep of "La Ferme" Tobacco Experiment Station...	2,236.11
Government Dairy	25,077.97
Minor Industries	9,287.09
British Industries Fair	1,197.12
Mission of Mr. E. F. S. Shepherd to Java and Australia	4,868.55
Contribution to Revenue towards cost of Sugarcane Research Station	9,000.00
Sugarcane Research Station :—	
Extra Clerical Assistance and Contingencies ...	720.00
Upkeep of Laboratories	2,880.10
Travelling Expenses & Services rendered by the Railways	1,104.11
Labour and Field Equipment	6,104.53
Upkeep of laboratory of Physiological Botanist ...	2,380.91
House allowance to Senior Geneticist and Physiological Botanist	620.97
Allowance to Physiological Botanist for course of training at East Malling Research Station ...	2,141.88
Farm School :—	
Allowance to pupils	50.28
Allowance to agricultural Cadets	31.92
Contingencies	388.53
Total	370,235.21

*The expenditure and receipts shown above are in respect of the calendar year 1932. The official financial year, in Mauritius, runs from July 1st in one year to June 30th in the following year. The Pound Sterling is equivalent, at present, to Rs. 13.80.

REVENUE

	Rs. cs.
Sale of plants	2,651.80
„ sugar cane	1,150.78
„ tobacco leaf	453.07
„ pineapple suckers	141.31
„ Seamin	180.00
„ B.C.G. vaccine	1,112.75
„ rice seed	7.85
„ produce from Government Dairy ...	31,726.07
Contribution from Co-Operative Credit Societies ...	1,105.00
Analytical fees	222.00
Sale of sweet potatoes	11.00
Miscellaneous	2,983.72
Sale of onion seed	29.25
Contribution from Improvement and Development Fund cost of Sugarcane Research Station	9,000.00
Contribution from Agricultural College Funds towards cost of Sugarcane Research Station	18,000.00
Contribution from Agricultural College Funds towards part salary of Director of Agriculture ...	3,000.00
Levy on salaries	15,665.16
Contribution to Widows and Orphans Pension Fund ...	3,632.81
Total	91,072.57

Meteorological conditions and sugar production.

Except for the occurrence of a cyclone of medium violence on April 10th, weather conditions were highly favourable from an agricultural point of view. Temperature was generally above average whilst the amount and distribution of rainfall was exceptionally good.

The cyclone which occurred on Sunday, April 10th, was fortunately of short duration but wind velocities excee ling 50 miles per hour were experienced at the Central Experimental Station. The centre of the disturbance passed over the Island and the consequent shift of the wind through 180° intensified its effects on the already tall canes. Fortunately this cyclone, unlike the 1931 visitation, was followed by showers which were well distributed all over the Island.

The sugar production, calculated on the moisture and temperature conditions which obtained during the growing season, irrespective of the cyclone, approximated to 262 thousand metric tons. The final

compilation of production for 1932 gave a total of 247.2 thousand metric tons, so that the reduction due to the cyclone approximates to 15 thousand metric tons, or 6%.

The following table gives the summarised results of the meteorological observations taken at the Central Experimental Station. Further and fuller records are given in Appendix I.

Month and Year	Air temperature °C	Departure from normal °C	Rainfall m/m	Departure from normal %
1931				
November	22.2	+0.5	160.5	+214
December	23.7	+0.4	46.0	− 66
1932				
January	24.3	+0.2	210.7	− 20
February	23.9	−0.4	396.6	+ 44
March	24.3	+0.6	339.4	+ 9
April	22.5	−0.1	265.5	+140
May	19.9	−0.6	110.3	+ 11
June	18.6	0.0	167.6	+ 90
July	18.1	+0.1	43.3	− 39
August	18.4	+0.4	41.2	− 22
September	18.7	0.0	50.3	+ 8
October	19.7	−0.1	43.4	− 14
November	21.9	+0.2	27.1	− 50
December	22.8	−0.5	51.3	− 62

The sugar production, in 1932, in the various districts of the Island, compared with the preceding years, is shown in the following table.

unit 1 thousand metric tons

Districts	1932	1931	1930	1929	1928	1927	1926
P/plemousses and Riv. du Rempart	62.73	41.81	43.00	54.68	59.55	52.72	44.15
Flacq	35.97	27.91	37.81	38.91	41.17	33.21	26.02
Moka	34.12	20.83	32 10	35.97	34.76	30 88	31.27
Plaines Wilhems and Black River	26.11	17.93	24.43	24.88	26.12	24.09	24.32
Savanne	41.63	27.61	37.09	36.41	41 41	35.88	35.13
Grand Port	46.66	28.52	46.53	47.18	50.42	41.22	31.70
Total	247.22	164.01	220.96	238.03	253.43	218.00	192.59

The extraction of sugar percent of cane approximated to 11.01. Figures for the last decade are as follows :—

Year	Extraction of sugar % of cane
1923 ...	10.51
1924 ...	10.28
1925 ...	10.56
1926 ...	9.94
1927. ...	10.53
1928 ...	10.76
1929 ...	10.84
1930 ...	10.92
1931 ...	10.61
1932 ...	11.01

A diagram exhibiting the sugar output of Mauritius from 1823 to 1932 is included in the Appendix to this report.

Grades of sugar.

The proportion of raws (98½° polarisation) is markedly higher than last year, being 87.5% as against 83 in 1931. The change which has taken place in this respect during the past ten years is illustrated in the following table :—

	Percentage of :—		
Years	Vesous	Raws	Lows
1923 ...	97.61 ...	... ...	2.80
1924 ...	98.34 ...	... ...	1.66
1925 ...	98.21 ...	... ...	1.79
1926 ...	98.10 ...	... ...	1.90
1927 ...	98.63 ...	... ...	1.37
1928 ...	71.80 ...	27.30 ...	0.90
1929 ...	23.90 ...	75.20 ...	0.90
1930 ...	16.80 ...	82.50 ...	0.70
1931 ...	16.20 ...	83.10 ...	0.70
1932 ...	12.10 ...	87.50 ...	0.40

Area under cane.

At the beginning of 1932, the area under cane cultivation was estimated at 134,915 acres. Estates with mill cultivated 50,735 acres and estates without mill 34,540 acres. The total estate cultivation was then 63% of the total area under cane. The balance was made up of lands cultivated by small planters, mostly Indian. It is anticipated that the total area under cane has been somewhat increased during the year, but no reliable figures are available as yet.

Disposal of the 1931 sugar crop.

As in preceding years, the bulk of the Mauritius sugar production went to the United Kingdom. The total exported at the end of the export year 1931–32 was 153,259 tons, distributed as follows :—

United Kingdom ...	137,533	tons (metric)
Dominion of Canada ...	15,495	„
Other places ...	231	„
Total ...	153,259	„

The exportation of the 1932-33 production was as follows at the end of December 1932 :—

United Kingdom	...	127,556	tons (metric)
Other places	...	125	„
Total	...	127,681	„

Sugar Market.

The deterioration of the sugar market continued during the early months of the year and had it not been for the assistance of Imperial Preference plus a slight improvement in market prices the sugar industry of Mauritius would have been inevitably ruined.

The local Sugar Syndicate continued its operations in 1932 on much the same lines as heretofore, controlling more than 80 per cent of the entire sugar production of the Island.

It is anticipated that the net price for the 1932 crop to planters, from the Syndicate, will be between Rs. 6.15 and Rs. 6.20 per 50 kilos, This figure does not include commission and/or brokerage. However, the average cost of production will be below the price received and the consequent favourable money balance will improve to some extent the precarious position in which the industry has, for the last few years, been placed. On a number of estates curtailment of expenses had passed the economic limit ; some improvement in factories and field may now, with confidence, be expected.

Labour conditions.

A reduction of wages took place in 1932 which corresponded with a general decrease in the cost of living as foodstuffs—rice in particular—experienced a marked drop in price.

The concentration of population (one-fourth of total) in the central and healthier district of Plaines Wilhems, renders often difficult the labour supply on estates unfavourably situated in the low-lying districts of the Island.

Sugar machinery.

Machinery to the value of Rs. 277,656 was imported during the year as compared with Rs. 399,124 in the preceding year. No tractors or ploughs were imported. Tramway material for use on sugar estates, to the value of Rs. 110,289, was imported as compared with Rs. 79,234 in 1931.

A diagram showing the number of sugar factories in operation between 1821 and 1932 is included in the appendix to this report.

Varieties of cane in cultivation.

The principal cane varieties under cultivation are :—White Tanna, D.K. 74, M.P. 55, M.P. 131, R.P. 8, D. 109, P.O.J. 213, Striped Tanna. White Tanna is still the leading variety, covering about 60% of the total area. D.K. 74, M.P. 55 and Striped Tanna seem to be losing ground, whilst some recently imported and locally produced varieties are gaining favour ; amongst these : B.H. 10 (12) is the most popular and is spreading rapidly. M. 13/18 and M. 27/16 are being appreciated and planted on a certain scale, so is P.O.J. 2878. Many other varieties are under the experimental stage, some of which are promising.

Fertilizers.

During the year 12,726,702 kilos were imported at a value of Rs. 1,325,439 as against 11,876,472 kilos in 1931 at a value of Rs. 1,515,208.

Sugarcane Research Station.

This organisation received its full complement of officers by the appointment and arrival of Dr. Evans, physiological botanist. Material progress has been accomplished and this is reflected in the résumé of the third annual report of the station included in Part 2 of this report.

Insect Pests.

That redoutable pest known as Phytalus (*Phytalus Smithi*, Arrow) continued to dominate. The collecting season of 1931–32 yielded a return of 356,876,737 beetles which was 32 million more than the preceding season. The season 1932–33 had, at the end of 1932, produced a total of 191,585,765 beetles showing a diminution on the previous season results at the same date of some 65 million insects. Weather conditions during the collecting season, however, had up till the end of the year been unusually dry—a factor which has in other years had an arresting effect on the emergence of adults. It is not wise, therefore, to raise at present any false hopes that this season may result in a total capture behind that of 1931–32. For many years the total numbers of the pest destroyed each season have continued to increase though, as the Chief Phytalus Officer points out in his report, the cessation of larval destruction during 1931 would tend to indicate that the increase in the number of beetles caught during the 1931–32 season is not so alarming as would at first appear. No campaign of larval destruction has been waged during 1932.

The new method of conducting the 1932–33 Phytalus campaign, suggested by Mr. de Spéville of Mon Désert, in accordance with the views of the Finance Commission, has so far worked with smoothness and efficiency. By the exercise of economy and through the generosity of the Sugar Industry Reserve Fund Committee and the Advisory Committee of the College of Agriculture plus the proceeds of the special tax on sugar export, the finances of the campaign should prove adequate. The Government has borne its share in the campaign by allowing the continuation of the appointment of two Phytalus officers and, also, through the general administration of operations through the Department of Agriculture. A short summary of the new procedure will be found in the report of the Entomological Division.

After a general survey of the Phytalus position in Mauritius I recommended that the previous propositions concerning the appointment of a special Entomologist to study the biological control of Phytalus be proceeded with and that a mission be sent to Madagascar to test the possibilities of securing further parasites for Phytalus. As a result of this mission, which was generously financed by the Sugar Industry Reserve Fund, a new species of Elis has been introduced in considerable numbers and should in course of time become successfully established. Through the kind offices of the Honourable Jules Leclézio, Chairman of the Sugar Industry Reserve Fund, who proceeded to Europe in September and in addition to other business consulted with

Sir Guy Marshall, C.M.G.,F.R.S., Mr. F. A. Stockdale, C.M.G., C.B.E. and Dr. W. R. Thompson, Mr. Jepson, who had been working at Farnham Royal, has been selected to prosecute studies in the biological control of Phytalus.

What of the future? Will this destructive insect for ever continue to deprive the sugar industry of this Island of a substantial part of its hardly earned profits? It is an exceedingly difficult question to answer but consideration must be given to the following points:—Phytalus does not, after having reached a maximum intensity of attack in an area, retain such intensity; there is a distinct tendency for the infestation to lessen and remain in a state of comparatively mild incidence. An infinitely greater interest is taken in the pest than in former years and the value of parasites is far better understood and appreciated. The hand collection of adults during their season of emergence is now prosecuted with great vigour. The cessation of the campaign of larval destruction during 1931 caused no abnormal corresponding increase of adults during the 1931–32 season of emergence. An intimate study of the further possibilities of biological control is about to be made. A fresh parasite has recently been introduced from Madagascar which gives promise. Last, but by no means least, there is the work of the Sugarcane Research Station which, in part, is being directed towards the production of a cane which, in addition to its other desirable properties, will possess a rooting system too deeply and strongly developed for serious attention by Phytalus larvae.

It is obvious that a series of serious obstacles are already in position against the progress of Phytalus and that a promising collection of further embarrassments will arise in the path of this pest in the near future. No possible avenue of attack will be left unexplored.

It must be admitted that some grounds most certainly exist for hoping that the reign of this tyrant insect will, in due course, come to an end.

Various diagrams illustrating the spread, emergence and cost of control of Phytalus, also the synchronisation which exists between this pest and its parasites are reproduced in the Appendix attached to this report.

Plant diseases.

It is fortunate that in the range of sugar cane diseases which exist in Mauritius, although possessing some members which are responsible for a certain quantity of loss, no outstanding malady exists which is capable of inflicting the same amount of damage as does Phytalus.

The modified method of performing the cane disease survey has given some interesting results among which is the fact that the figure for stem deterioration, as far as White Tanna is concerned, has not exhibited much variation during the last three years.

Diseases of tobacco have received special attention as this crop is particularly liable to injury from such causes. It appears that by a judicious rotation of crops, by refraining from the application of pen manure both in the nursery beds and fields and by the utilization, where necessary, of properly prepared spray compounds, the incidence of disease can be largely guarded against.

The development of pineapple culture is receiving careful attention from the disease standpoint. The incidence of a "heart rot" was observed at an early stage and planters instructed to destroy all plants exhibiting suspicious symptoms.

A new line of work has been the study of diseases of lawn grasses and of their manurial requirements. Excellent lawns are a feature of the Island but of late years the spread of certain diseases and pests has caused some disfiguration.

Rigorous inspection of plant imports has been continued. The absolute necessity of such a service in Mauritius is now well understood and friction with the public over such a matter has happily been reduced to a minimum. The existence of an exacting plant inspection organization in years gone-by would have saved Mauritius many millions of rupees.

Tobacco industry.

With the opening of the Government Tobacco Warehouse in February this industry was placed on an entirely different footing. Growers can now be sure of obtaining a regular price for their products and manufacturers will in future be sure of their immediate supplies. The effect of this development of locally grown tobacco is admirably illustrated in the graph which is reproduced in the Appendix. It is only natural, perhaps, that the small planters were a little apprehensive at first of the activities of the Warehouse but confidence is now fully restored. The production of good quality leaf is rapidly progressing, indeed it is astonishing how quickly local planters have assimilated all the intricacies of barn curing and grading; it is an achievement of which Mauritius may well be proud. Many problems await solution however. The question of disease is too evident; Black Shank (*Phytophthora parasitica*, Dast. emend Ashby), in particular, has proved highly destructive and other organisms have taken their toll. Advice given in such matters by technical officers of the Department, when followed, has proved to be efficacious. Insect pests, though presenting a series of difficulties, have not proved so serious a problem as the question of disease. Exact information concerning the manurial requirements of the local crop is still in its earliest experimental stage and the relationship which exists between manures and leaf qualities awaits careful examination. To date, the variety known as Amarello has proved most suitable for local conditions and requirements, but it is by no means entirely resistant to disease. The Government Tobacco Board have asked for the services of a special officer with plant breeding qualifications who can devote at least three years to the production of varieties which will grow satisfactorily under local conditions, prove suitable for local manufacture as well as for export, exhibit as much resistance to disease as possible.

There can be no doubt that this local minor industry shows promise of a successful future. It has survived a number of serious setbacks in its infancy and has at last struggled through to definite establishment. It will require careful nursing, however, before it can be said that it fully meets local requirements and a strong export trade built up.

The affairs of the Government Tobacco Warehouse will be dealt with in a separate report to be published later.

Aloe fibre industry.

This industry remained in a stagnant condition during the year on account of the low prices of aloe fibre. Grade Prime was sold between Rs. 200 to Rs. 210 per ton, and the other grades at about Rs. 15 less per ton according to quality, leaving only a very small margin of profit to fibre factory owners. Offers from buyers were not numerous and this, added to the low prices, were the reasons why the output remained at practically the same level as last year.

Mauritius aloe fibres were permitted free entry into England, foreign fibre having to pay a 10% duty ad valorem, but unfortunately up to now British firms are not utilising to any increased extent the local fibre. It is hoped that a favourable report will soon be received from the Admiralty and the Imperial Institute concerning trials made with aloe fibre. Samples were sent to the British Industries Fair.

The inauguration of the factory belonging to the Mauritius Spinning and Weaving Company Limited took place on the 19th of March ; the results obtained up to now are encouraging, and it is hoped that this new industry will make considerable progress in the near future.

The factory turns out excellent bags woven from the aloe fibre which are utilised for the exportation of sugar and favourable reports have been received concerning their service in this respect.

The bags measure 38"x 26½" and can hold during transport 80 kilos of sugar. They are sold at 45 cents each. Their length can be increased, but for large orders only.

A rough but strong cloth is also turned out ; its width is 26½" and it is sold at 25 cents per yard. Twine of a good quality is produced and sold at 25 cents per lb.

The production of fibre during the year was as follows :—380 tons delivered to the Fibre Syndicate ; 282 tons delivered to the Spinning and Weaving Factory.

Pineapple industry.

After a period of hesitation there are now positive signs that the public is really taking an active interest in this industry. A Pineapple Committee composed of representative planters with the Director of Agriculture as Chairman has been appointed in order to co-ordinate interested effort. Many orders for plants of Smooth Cayenne have been received by the Department and arrangements have been made for the rapid propagation and distribution of this variety. There are now twenty five acres under Smooth Cayenne and it is intended to plant forty acres in the early months of 1933. This increase in the acreage of this desirable type of pine for canning represents a very real progress.

A regular supply of fruits was delivered at the Canning Factory, Port Louis, during the fruiting season from December to January. The output was on an average about 200 cases daily of a net weight of 4,000 kilos.

It has now been decided to adopt only one Trade Mark "The Dodo." The latest reports on canned Mauritius pineapples, received from London, were encouraging ; the prices paid compared favourably with those of the best Hawaiian products. The question of grading and upkeep of quality is receiving close attention.

Tea industry.

Some improvements have been made in the cultivation and preparation of tea in this island as the results of the visit and recommendations made by Commander Goolden in 1930. The plantations are now better cultivated and improved methods of tea manufacture have also been effected.

In order to assist the local tea industry, the import duty on foreign tea was raised during the year from 40 to 60 cents per Kilo; this help has been appreciated by tea planters and encouraged them to extend their plantations. Plants of a superior quality of tea have been raised by the Agricultural Department and sold to Bois Chéri and Curepipe Tea Estates.

Tea seeds have been received from the Ceylon Department of Agriculture, the germination was good and the seedlings are now growing well.

Forty acres of new plantation were made at Bois Chéri Estate during the year.

The total output from the three factories was as follows:—

Bois Chéri Estate ...	...	6,000 kilos
Curepipe (Corson) Estate	...	10,000 ,,
Nouvelle France Estate	...	200 ,,

Rice industry.

Owing to the exceedingly low price of rice the cultivation of this food plant has decreased and only 125 arpents were under this crop during the year. The small planter finds that he can obtain more remunerative results from growing other food crops. Most suitable land at Midlands was offered to small cultivators for rice growing by the Department with the added attraction of favourable terms of lease as well as seed at an extremely low price. No interest was exhibited in the proposition however.

The rice mill at Port Louis experienced a dull year and only 159 bags of paddy were dealt with. It is interesting to note that this factory now turns out such by-products as toilet powder, rice flour and a number of preparations for culinary purposes.

Coconut industry.

The majority of coconut palms in different parts of the Island have now recovered from the effects of the 1931 cyclone and are bearing a good crop of nuts. The damage done by the coconut scale insect (*Aspidiotus destructor*) is not so bad as in former years, as it is in many places controlled by its parasites.

Small plantations of Pemba coconuts have been established at Barkly and Pamplemousses Experimental Stations. The trial plantation of this variety at "Cannoniers Point" was not a success. Another consignment of nuts has been ordered from Zanzibar, these will be raised in the Nurseries and afterwards the plants will be sold to the public.

The export of copra during the year was 1,746 tons of a value of Rs. 287,516. In 1931, 2,559 tons worth Rs. 395,445 were exported. The export of coconut oil during 1931 amounted to 5,480 kilos of a value of Rs. 2,176. In 1932 it amounted to 3,707 kilos valued at Rs. 1,723.

Vanilla industry.

No progress has been made during the year. It is estimated that there are ten acres under cultivation in different parts of the Island besides many abandoned plantations which have now reverted to forests but where the vanilla vines are growing vigorously.

At the request of planters, the import duty on vanillin has been raised from Rs. 40 to Rs. 110 per kilo. On unprepared vanilla, from 5 to 15 rupees and for prepared vanilla from 10 to 25 rupees. It is hoped that this will induce many to take up this profitable crop.

Honey industry.

It is interesting to notice the rapid progress made with bee-keeping within the past few years. The honey obtained by the "Rucher du Nord" and its suppliers for the past three years is as follows :—

1929–30	...	... 1,260 lbs.
1930–31	..	... 2,250 „
1931–32	...	... 7,700 „

It is estimated that about 6,000 lbs. will cover local consumption but there is no doubt that this quantity could easily be increased by intensive advertising and propaganda. Favourable reports have been received concerning samples sent to the British Industries Fair.

The duty on foreign honey, which was formerly 12% ad valorem, has now been altered to 44 cents per kilo (General Tariff) and 22 cents per kilo (Preferential Tariff.)

In order to encourage bee-keepers, the Agricultural Department has distributed free seeds of the best nectar-producing plants.

Rum, industrial alcohol and Cernite.

During the year 378,209 litres of alcohol were distilled for human consumption as against 618,172 in 1931. The export of rum amounted to 5,308 litres valued at Rs. 1,489 as against 21,086 litres valued at Rs. 6,623 during 1931.

In 1918 a patent was granted to Messrs. Edouard Langlois and Philippe d'Oisy Fayd'Herbe to protect a full mixture composed of ether 30%, alcohol 60%, kerosene 10%. The mixture was manufactured by the "Cernite and Alcohol Cy. Ltd." and was sold under the trade mark of Cernite, for internal combustion engines. After a short while, the manufacture was given up, owing to the incidence of a high proportion of impurities in the alcohol and ether produced in the Company's distillery. Since then, considerable progress has been made in the manufacture of both alcohol and ether through the erection of modern plants in St. Antoine distillery.

In 1929 the production of Cernite was started again and after a somewhat lengthy experimental period all the difficulties in the manufacture of ether were overcome. The composition of Cernite was modified by increasing the amount of alcohol to 64% and reducing that of kerosene to 6%, and the new mixture was put on the market. At first the consumers were not numerous, in spite of a selling price lower than that of motor spirit. But after a few months their number increased gradually until the price of motor spirit was raised to Rs. 14 a case of 8 imperial gallons (June 21st, 1932). Since then, the demand for Cernite has exceeded the production.

At the same time, the manufacture of Industrial Alcohol of a high quality was developed in a few modern plants. The use of alcohol, pure or mixed with a certain percentage of motor spirit in internal combustion engines, gained favour, and ran parallel with that of Cernite. For the six months ending December 31st 1932, the production of Cernite reached 162,200 litres and that of industrial alcohol 124,340. The alcohol produced is pure, but contains only 94.5% anhydrous alcohol, by volume.

Experiments were carried out by the Sugar Technology division of this department with Cernite and Industrial Alcohol, results of which are published both as a leaflet and also in the Revue Agricole. Industrialists are prepared to invest in plants for the production of anhydrous alcohol, provided that adequate protection be given to the industry.

These subsidiary industries are promising and deserve protection and encouragement.

Sugar Technology.

A useful year's work has been accomplished by this Division whose services are greatly in demand during the grinding season. The "Controle Mutuel" appears in the appendix of this report for the first time; it contains information of high interest. This "controle" has now been in practice for a number of years in Mauritius and is being adopted by other sugar producing countries in the world.

Veterinary, livestock and Government Dairy.

Less cattle for beef purposes were imported during 1932 than 1931. This is no doubt to some extent due to the reduced purchasing powers of the Mauritius public but a reduction in such figure should rather be looked for as coming from a development of local cattle of beef type. It cannot now be argued that Surra still definitely limits successful cattle raising in Mauritius. The proof of this statement lies in the existence of more than one individual who has by the exercise of sound judgment and attention to diseases established a herd of animals from which no mean profit has been derived both from sale of animals for slaughter and from the disposal of manure properly stored and attended to.

The value of the administration of B.C.G. vaccine, in Mauritius, is unquestionable and its yearly, increasing popularity is highly satisfactory. The Veterinary Division has, as usual, exercised particular vigilance over the incidence of animal disease and, as well, every precaution has been taken in order to prevent the introduction of maladies from abroad.

The dipping tank at Quay "C," Port Louis Harbour still needs the installation of a drinking trough in the pre-dipping enclosure; this tank was not utilised during the year.

Through the instrumentality of the Public Health Department Balinese Baskets were introduced from Java for shipping pigs from Rodrigues to Mauritius and they have proved completely successful.

The Government Dairy, as described by the Officer-in-Charge, was re-organised during the year in certain particulars concerning the sale of milk. This has proved an undoubted success and the institution should yield a material profit at the end of the financial year 1932–33.

The list of private customers grows monthly and most satisfactory reports have been received from them concerning the quality of the milk. There have been very few hitches owing to transport and delivery which speaks well for the organisation. Milk as usually sold in Mauritius to-day is open to well-justified criticism concerning its purity and the institution of a reliable source of this very necessary household commodity is a distinct boon which the public have not been slow to appreciate. Abortion has been reduced at the Dairy but still gives cause for some apprehension. The causative organism has been examined by authorities in South Africa who pronounce that it is, definitely, not of the ordinary type.

A diagram illustrating the yields of milk obtained from the cows of the Government Dairy is reproduced in the appendix attached to this report.

Co-operative Credit Societies.

A summary of the annual report on the work of these societies is included in the Report of the Department this year. Hard times have caused many of these organisations to descend into very low water indeed and it is obvious that in some cases liquidation will be the only logical course to pursue. The legislation under which these societies operate is very much out of date and, on a number of points, ill-adapted to deal with local conditions. A complete report on the deficiencies of the legislation was made during the year which will prove a basis on which to re-model. Another weak point is the insufficiency of supervision and steps have been taken to remedy this outstanding defect. It is anticipated that the improvement of local conditions of finance and attention to the points above enumerated will bring about a gradual, general improvement. It will be an uphill task, however, as the ill effects of long years of stagnation, abuse and ignorance have all left their mark on the movement in general.

College of Agriculture.

The work of this institution has proceeded smoothly and efficiently. The former three years' course of study has now been reverted to and it is expected that this will improve the standard of pupils. Seven first year students were admitted in April for the Diploma course. Three second year and two part-time students attended during the year.

School gardens.

There are now thirty six of these gardens as against thirty two during 1931. As usual, they were regularly inspected by various officers of the Department.

Research.

It is indeed true that the amount of research work carried out by officers of this Department is limited to some extent by their teaching duties at the College of Agriculture. This cannot be regarded in any way as a setback for by their teaching duties they have assisted in the production of trained individuals who themselves are at present engaged in assisting in research either in Mauritius or abroad. All of the Scientific Assistants attached to the Sugarcane Research Station, for instance, secured their diplomas at the College of Agriculture.

Rodrigues.

Owing to improved mail services it has been found possible to include the annual report of the Agricultural Superintendent this year.

During 1932 absence of rain has once more made itself felt and some shortage of food stuffs was experienced. On one occasion when rain fell it did so with such violence that damage to plantations resulted.

Particular attention has been paid to tobacco production. The heavy, evil-smelling bales of Rodrigues leaf, which have for some years found a ready market in Mauritius, no longer find a demand and the prices paid by the Government Tobacco Warehouse for such leaf are not remunerative. An attempt has therefore been made to induce Rodrigues farmers to grow and prepare a better quality of leaf ; demonstrations are in progress and free seed has been provided ; a special officer visited the Island during the year to deal with this matter.

The newly instituted demonstration plots have, on the whole, met with some success.

Réduit,
March 1st, 1933.

G. E. BODKIN,
Director of Agriculture.

PART II

REPORT* OF THE SUGARCANE RESEARCH STATION AND DIVISIONAL REPORTS OF THE DEPARTMENT OF AGRICULTURE

SUGARCANE RESEARCH STATION

Introduction.

With the arrival on March 31st of the newly appointed Physiological Botanist, Dr. H. Evans, the Station was up to full strength for the first time since its opening in January 1930. The need for this Officer's services had been felt for a considerable time as many problems connected with the growth and physiology of the sugar cane need thorough investigation.

At the present time very little is known as to how, when and where sucrose is found in the cane. Again, while the above-ground region of the sugar cane is a familiar subject for research, our knowledge of the underground system of the cane is extremely limited. Consequently, there is a real need for a comparative study of the root systems of the various cane varieties, throughout the seasons, in the different soils and climates of the island. Such a study should go hand in hand with an investigation into the various functions of the different organs and tissues of the whole plant. Dr. Evans' main programme of work has therefore been laid down as follows :—

1. The investigation of the course of growth throughout the crop year.
2. The analysis and reconstruction of the various root types found.
3. The investigation of root growth throughout the crop year.

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* The Sugarcane Research Station publishes a progress report at the end of June and an annual report at the end of the calendar year. These reports are published separately from the annual report of the Department of Agriculture. Owing to the size of the annual report of the Station it is impossible to reproduce it here, so a résumé has been prepared by the officer-in charge of the Station.

With regard to the last two items of this programme, it is hoped that the results of these root studies will also indicate for which root types to breed when considering the resistance or tolerance of new cane seedlings to the attacks of *Phytalus Smithi*, a local pest that so far has defied control. It may be noted here that Phytalus larvæ are normally found in the top 9 inches of soil, the region in which noble cane types develop their root systems whereas Nobilised Glagah types have been found with roots situated in a lower zone below the usual Phytalus region. The breeding of deep rooted seedlings may possibly solve the Phytalus problem in time. In addition to the above programme, Dr. Evans will undertake several minor investigations as time permits. The results of one such investigation already carried out are of particular interest showing that the mere soaking of setts or cuttings in various mixtures before planting has a definite and beneficial effect on both the rate and percentage germination.

The research work of the Bio-Chemical Division under the charge of Mr. N. Craig has been concerned chiefly with the continuation of the soil survey of the island, in order to define roughly the limits of the various soil types. Such work must be regarded as the foundation for all soil research as without it the results of manurial and other trials conducted in one district cannot be applied to another.

As a result of the soil analyses conducted up to date the soils of the island can be divided roughly into three classes:—

1. Highly laterised soils of the high rainfall districts.
2. Red and black siliceous soils of the dry and hot districts.
3. Soils of the "terre franche" type intermediate between 1 and 2.

The laterised soils of class 1 above are characterised by low pH values, low or medium total exchange capacity and high lime requirements. As only small quantities of potash are usually present it is unlikely that much is available in exchangeable form. Class 2 above, on the other hand, is rich in exchangeable bases and in consequence more nearly neutral. Such soils contain a greater amount of potash and judging from the results obtained up to the present time there is a fair amount available in exchangeable form. With regard to the phosphates found in all types analytical results up to date suggest that deficiency of available phosphate is of common occurrence. Where such deficiency exists experiment has shown that the application of phosphatic guano results in considerably increased yields.

Twelve of the fourteen manurial trials laid down on estates some time ago were harvested in 1932. These consisted of five nitrogen, five phosphate and two potash experiments. An analysis of the results shows that as regards the nitrogen experiments, excepting in one case, no significant increase in yield has been observed to result from the applications of nitrogen given. Similar results were observed from five experiments conducted in the previous year suggesting the urgent need for laying down correctly designed nitrogen experiments on every estate. Of the phosphate experiments harvested, that at St. Aubin showed a significant and substantial increase in yield, resulting from the application of insoluble phosphates, while an interesting relationship between the P_2O_5 content of the soil and the cane juice was

observed. With regard to the two potash experiments one of these showed a small increase in yield resulting from the application of potash.

It is very necessary that these manurial experiments should be multiplied in number and extended until such time as significant results have been obtained from all over the island. It will then be possible to interpret correctly the analytical results of the soil survey and state the manurial requirements of the various soils on the different estates. Lime and coral sand experiments are being added to the series this year and, where possible, buffer plots will be established between the treated and the controls, in order to minimise the risk of seepage.

Cane Breeding.

The Cane Breeding policy of the station has remained unaltered since last year with the exception that Gummosis Resistance trials have been introduced into the breeding programme for the first time. The breeding programme aims at the production by modern methods, of vigorous hybrid seedlings of high yielding and disease resisting powers to replace those varieties in the island which now prove inefficient judged in the light of recent results obtained elsewhere. The actual breeding work and testing is carried out in two districts, Réduit and Pamplemousses, so that selections are made for two definite zones, firstly the cool and damp uplands with an 18 months virgin crop and secondly the hotter and drier lowlands with a 12 months crop.

The following summary shows the progress made during the past three seasons. It will be seen that the number of seedlings produced in 1932 was double that obtained in 1931 while at the same time the number of uncontrolled crosses was reduced considerably.

Summary of crosses made and seedlings produced 1930 to 1932.

	Crossing Season		
	1930	1931	1932
No. of controlled crosses made including selfings	409	355	457
No. of uncontrolled crosses	569	370	46
No. of seedlings produced	52,840*	72,888†	157,948‡
No. of seedlings potted out for planting ...	20,108	29,263	35,863
No. of first year seedlings distributed to estates for planting	3,000	5,000	16,040
No. of 1930 seedlings retained for further trial after first season	213=1%	...	...

With regard to the Gumming Resistance trials mentioned above, these have now been introduced as it is felt that no seedling, however perfect when judged by ordinary standards, should be retained after its second season unless highly resistant to gummosis. Fortunately gum-resistance in seedlings can be tested at an early stage by using the

* Including 9,593 from uncontrolled crosses and 1,655 from Javan fuzz.
† „ 2,091 „ „ 12 „ Hawaiian
‡ „ 2,168 „ „ 150 „ „

method devised by D.S. North of Queensland, and as from the 1932 season at least three cuttings of all first year selections made will be handed over to the Mycologist for testing in Gum-Resistance trials. Seedlings of certain crosses tested up to date have shown a degree of resistance to Gummosis approaching immunity while others are equally susceptible. These resistance trials will be conducted at the same time as the selected seedlings are undergoing their first yield trial in Latin Squares.

As it is thought that resistance or tolerance to insect attack might be measured by similar methods, attempts will be made to devise a method for testing the resistance of seedlings to Phytalus, our most serious insect pest.

Types of crosses made.

A considerably increased number of crosses of the Nobilised Glagah type were made in 1932 in an attempt to obtain seedlings possessing great hybrid vigour. Below will be found a summary showing the types of crosses made during the season. It will be seen that an attempt was made to produce a considerable number of 4th Nobilised Glagah seedlings as the writer believes that success lies largely in the exploitation of this type.

The progress made with interspecific crosses has been satisfactory as regards those crosses with Saccharum spontaneum but the intergeneric crosses with Andropogon sorghum could not be attempted again this year owing to the very early flowering of the Sorghum varieties.

Crosses between noble canes and Erianthus ravennae were attempted for the first time, this being the first season since the opening of the Station when Erianthus has shed pollen. There are very strong reasons for supposing that some of the seedlings produced are actually intergeneric hybrids and not selfs.

An unsuccessful attempt was made to cross Vetiver with noble cane.

TYPES OF CROSSES MADE IN 1932.

	Réduit and District	Pamplemousses and District	Total
Interspecific :—			
Glagah × Noble	1	2	3
1st Nobilised Glagah × Noble ...	8	6	14
2nd „ × „ ...	1	5	6
3rd „ × „ ...	72	61	133
4th „ × „ ...	...	3	3
Noble with Chunnee types ...	27	2	29
„ Sinense „ ...	26	11	37
Intergeneric :—			
Noble × Erianthus ...	3	1	4
„ × Vetiver	...	1	1
Noble Crosses	130	48	178
Other Combinations	31	6	37
Total ...	299	146	445

First year seedlings planted out.

Approximately 160,000 new seedlings were raised in 1932 of which 36,000 were potted out for planting on our experimental stations. The demand from estates for first year seedlings increased considerably during the year and sixteen thousand seedlings over and above our own requirements were distributed in this way, the only conditions attaching to the distribution being, that the Station should be allowed to carry out selection work at the end of the first season and claim half the canes in any stool selected, "M" numbers being given to these selections in the usual way. It is hoped to develop this branch of our activities considerably in order to facilitate the problem of selecting for the numerous climatic zones of the island.

Selections made.

The first seedlings bred by the Station, in 1930, were selected in the early part of 1932. In all 204 or 1% were selected for further trial out of approximately 20,000 planted out in the field.

Promising seedlings.

Selected seedlings of the cross P.O.J. 2878 × Uba Marot are of particular promise for certain lands owing to their very vigorous growth, early maturity, high Refractometer Brix, freedom from arrows, free trashing and immunity to Gummosis.

The most promising type of seedlings selected up to date are those of the 4th Nobilised Glagah type. In the writer's opinion this type will yield the best local canes of the future.

Cane variety yield trials.

As the result of twenty controlled experiments conducted throughout the island by the Sugarcane Research Station during 1931 and 1932 with virgin and ratoon canes the following varieties are recommended owing to their excellent performance in several trials:—M. 13/18, BH. 10 (12), M. 23/16 and M. 27/16.

With regard to the Java variety P.O.J. 2878, from which much was hoped, this cane was tested in three trials and gave excellent results in virgins and ratoons in two of these yielding in one instance, at the rate of 6.63 tons of sugar per acre in first ratoons as compared with 3.39 tons for White Tanna, the control variety in the experiment. In the third trial however BH. 10 (12), the control variety, yielding 5.36 tons of sugar per acre was superior to P.O.J. 2878 which yielded at the rate of 3.39 tons per acre only. This P.O.J. variety would appear to behave erratically judged by its appearance in various parts of the island. When growing under adverse conditions it compares unfavourably with White Tanna and with "M" seedlings. The variety P.O.J. 2725, in the only experiment in which it could be tested, was inferior to BH. 10 (12), the control variety, but slightly better than P.O.J. 2878. It will be possible to report more definitely on the behaviour of P.O.J. 2878 after recording the results of the eight experiments in which this cane is now being tested in the various districts of the Colony.

The Mauritius varieties M. 12/21 and M. 5/22 although excellent in some experiments were erratic, like P.O.J. 2878, and so cannot yet be recommended for general planting.

The following "M" seedlings having given good results in at least one experiment are recommended for further trial :—M. 109/26, M. 14/26, M. 7/23, M. 26/20, M 35/17, M. 17/18 and M. 34/22.

None of the numerous seedling selections produced by the Sugarcane Research Station will be released for general distribution until after undergoing severe tests.

Other investigations.—Growth rate experiments with sugar cane.

In 1930 with a view to undertaking a detailed study of the relative influence of the various factors affecting cane-growth, the writer established growth rate experiments at Réduit and Pamplemousses using the varieties White Tanna and P.O J. 2878. In these experiments, which extended over two years, the weekly growth rate, for virgins and ratoons, was measured in the case of every cane in five stools of both varieties at each centre, while at the same time the following factors were recorded : rainfall, soil moisture, temperature, sunshine, wind velocity and humidity (as measured by Livingstone atmometers). These growth-rate measurements have now been analysed in detail by the Physiological Botanist and can be summarised here as follows :—

(1) That the period of maximum cane growth corresponds with the period January to April, the times of maximum, minimum and intermediate growth coinciding at Réduit and Pamplemousses in 1931 and 1932.

(2) That a significant correlation exists between growth rate, soil moisture, temperature and relative dryness of the atmosphere.

(3) That there is a high correlation between the growth rate of both varieties.

(4) That the net amount of damage done by cane-borers in 1931 was greater than the damage done by the severe cyclone of March 1931 when approximately 28% of the canes in the experiment were destroyed.

Rapid multiplication experiment.

With a view to determining how quickly a new cane variety could be multiplied, an experiment was laid down in 1930 to determine what rate of multiplication could be obtained from cane seedling, using the method of planting every aerial bud in the stool. One stool of each of two seedling varieties were used for the experiment, and after the removal of the "tops," which were planted as controls, the remaining canes were cut up into single-eye cuttings and planted. The results obtained from this experiment are exceedingly interesting showing :—

(i) That the weight of cane obtained from the single stool planted was 1,850 Kgs. in the case of one variety (M. 1/17).

(ii) That the return obtained from single-eye cuttings of both varieties was the same or 100-fold approximately.

(iii) That the return from single-eye cuttings was proportional to the weight planted.

(iv) That the yield from single-eye cuttings was approximately the same as from "tops".

A. GLENDON HILL,
Senior Geneticist,
i/c Sugarcane Research Station.

I

AGRICULTURAL DIVISION

Central Experiment Station Réduit.

As in previous years, experiments were carried out with sugar canes, eddoes, tannias, ground nuts, gram, pigeon peas, yams, rice, sweet potatoes, manioc, pineapples and leguminous plants used as green manure.

Sugar Cane.

The following varieties gave the heaviest yields in the different trials viz:—M 1316, M 2316, M 2716, M 717, M 3517, M 1318, M 2518, M 1025, M 1426, M 4726, M 5126 and M 10926 all of them Mauritius seedlings and the Barbados cane B. H. 10/12. Some 6360 cane cuttings of the best varieties were sold to planters who had applied for them. The varieties greatly in demand were M 2316, M 1426 M 10926 and B. H. 10/12.

As some complaints were received from planters that the charges made by the Railway Department for transport of bundles of cane tops for planting were very high, in some cases exceeding three times the value of the cane cuttings; arrangements have now been concluded with the General Manager of Railways, which will give satisfaction to all concerned. In future, a uniform rate of thirty five cents per bundle, not exceeding forty kilos, will be made for transport between any two Railway Stations.

Sweet potatoes.

Thirty three varieties of sweet potatoes were tried, the weights were carefully recorded when harvested; those which gave the best results were varieties Réunion, Egyptian Bebai, Turkey claw, and Bourbon with a yield of from nine to ten tons per acre as compared with an average yield of about four tons per acre of the other varieties.

Pineapples.

A small plantation of 1,536 plants of Smooth Cayenne pineapple was made in Field 11, and another plot of 1,990 suckers was planted in the former Stock Garden. The plants were at first slow in starting growth, but after they had received an application of half an ounce of sulphate of ammonia per plant, they made good progress; many are bearing fruit, some are in flower, and the others in full vegetation.

Manioc.

In order to have cuttings of manioc available for distribution a number of the best varieties were planted in Field 1. The yields obtained were as follows:—

Manioc de table	...	3099 kilos per acre	
Constantin	...	3079	„ „
Federated Malay States	...	2254	„ „

Fibre trial plot.

The plants of Sisal (*Agave rigida*) "Aloès bleue" (*Agave Americana*), "Aloès malgache" and "Creole" (*Fourcroya gigantea*) in the fibre trial plot started last year, are growing vigorously. It is intended later to compare yield of fibre of the different species, time of poling, and any

other items of interest. A small plot of Agave cantala, the Java cantala fibre plant, was also grown in order to have plants on hand for distribution if required by alœ fibre factories.

Tung oil plot.

The small plantation of Tung oil plants (*Aleurites Fordii*) is growing well; the plants remained in a dormant condition during the winter and several months after; when the warm season was well advanced, fresh shoots appeared. There is no doubt that the Tung oil tree will grow rapidly in Mauritius but owing to the brittle condition of the branches and stems, which are badly damaged by cyclones, there are no chances that it can ever be grown on a large scale in the Colony.

Pigeon Peas and Gram.

Plantations of these two important pulse plants were made, the growth in the field was very irregular owing to attacks by nematodes, caterpillars and other insect pests. The results obtained were not satisfactory.

Rice.

Experiments with rice to find out the proper time of planting and spacing were carried out in Field 2, but unfortunately the weather was dry during the growing period of the crop and as there was no watr available for irrigation, the plants were stunted and the yields poor.

Barkly Experiment Station.

This Station was visited by many planters and members of the public in order to buy seeds and plants, to obtain information and also to observe the different experiments in progress.

The fruit trees in the orchard are growing well, all the best varieties have been propagated and are now available for sale. Interesting additions to the existing collection were made by exchange and also by the introduction of new plants from Australia and U. S. A.

The following are some of the plants received :—

Grape Vines :—Ohanez, Sultana, Zante Currant, Waltham Cross (Rosaki), and Gordo Blanco.

Oranges :—Jaffa, Paper Ruid, St. Michael, Ruby blood, Thompson's Improved Navel, and Valencia late (Pickstone's.)

Lemons :—Eureka and Villa Franca.

Japanese Plums :—Burbank, Satsuma and Shiro Smomo.

Almonds :—Drake's seedling, IXL, Ne plus ultra, Non pareil, Paper shell, and Texas prolific.

Nartjes :—Oonshu (tangerine).

Plums :—Coe's golden drop, River's early prolific and River's late prolific.

Pecan Nuts :—Oklahoma, Williamson, Western Schley and Texas prolific.

Fig :—Adai.

Peaches :—Waldo and Peento.

An experimental plantation of different species and varieties of Citrus was made and the results, so far, are satisfactory; many new kinds have been budded on Shaddock and Seville Orange stocks. It is

intended to propagate as many as possible in order to distribute them, later, for trial in the warmer districts of the Island. A windbreak of Pithecolobium (Bread and Cheese) has been planted to shelter part of the plantation from prevailing winds. Twenty eight dwarf Pemba coconuts were planted along the boundary; they are well established and have started to grow. This coconut has many good qualities; it bears when about five years old, is very prolific, the trunk is so short that the nuts can be easily picked, it offers great resistance to the wind, the meat and milk are sweeter than in other varieties. Experiments were carried out with many food plants. Seeds, tubers and cuttings of all available kinds were distributed to the settlers on the neighbouring Allotment plots.

A concrete solar propagator was erected for the rapid propagation of "Smooth Cayenne" pineapples by slices. The operation is simple and as follows:—Rings about half an inch thick are cut from old stems, soaked for about five minutes in a 5% solution of Permanganate of Potash and then planted in sand in the propagator; the results obtained are encouraging and it is hoped to propagate a large number of plants as there is a very large demand for them.

Cuttings of pepper vines were received from Java and Madagascar, they have been planted and are growing well. A few seedlings were also raised from seeds received from Ceylon. A new barbed wire fence was erected along the Prison grounds boundary. The roofs of the cowshed and cartshed were rethatched. All irrigation canals were repaired. The six heifers and the young bull kept at the Station to provide manure are in a healthy condition.

The revenue for the sale of plants and seeds during the year amounted to Rs. 1,073.18cs. The rainfall at this Station amounted to 1,335.42 millimetres during the year; 1,171.20 millimetres of rain fell during the first six months and only 164.22 millimetres or less than one seventh in the second half year.

Royal Botanic Gardens, Pamplemousses.

The gardens were kept in good condition throughout the year. All the kiosques and bridges were repaired. The canals, lakes, lawns, roads and paths were attended to. Trimming of the hedges and grass borders was regularly done. The flower beds were planted with a collection of annuals and other plants according to season. Plants and seeds were sent in exchange to Agricultural Departments in Réunion, Federated Malay States, Madagascar, United States of America, China, Gold Coast, Seychelles, etc. They were also supplied to other Stations of the Department and Government Institutions. Many visitors came to the Gardens to admire one of the Talipot palms which flowered during the year.

Sixteen "Coco de mer" (*Lodoicea seychellarum*) nuts were received from Seychelles; they have been sown in different parts of the gardens.

The gates and iron railing were painted. The first Overseer's quarters were repaired.

Cuttings of sweet potatoes and manioc, tubers of yams, eddoes and tannias, seeds of maize, pigeon peas and other food plants were distributed to the plot holders on the Bois Marchand, Floréal and Malherbe Allotments. Fifty five dwarf Pemba coconuts were sent to the

Quarantine Station at Pointe aux Canonniers for trial. 295 Mango grafts, 200 letchi layers and other fruit trees were sent to Abercrombie Nursery and Barkly Experiment Station. The letchi crop was sold by public auction for Rs. 300. The queen pineapple fruits for Rs. 75 All the Smooth Cayenne pineapples were sent to the Canning Factory. A solar propagator has been erected for rapid propagation of pineapple by slices from old stems in the same manner as at Barkly. The total rainfall during the year was 1,738.87 millimetres.

Abercrombie Nursery.

A large number of economic and ornamental plants were raised in the Nursery and sold to the public. The total sales during the year amounted to Rs. 1,197.90 cs The expenditure including wages, tools etc. was only Rs. 678.13 cs. A house was built for the Overseer in order to have someone resident on the spot and to prevent petty larceny. The coconut plantation in the vicinity of the Nursery was kept in good order.

Food Settlements.

Plantations of food crops were made by shareholders of St. Martin—La Ferme Co-operative Credit Society on the following lands leased to them by Government:—

11	acres along La Ferme Canal
39	„ on St. Thomas Crown land
33	„ on St. Martin
.58	acre at Lower Plaines Wilhems cemetery
Total 83.58	

Along the La Ferme canal and in a few other places, where water is available, a large collection of vegetables were grown throughout the year, elsewhere it was only possible to grow manioc, maize and sweet potatoes during the rainy season. Seeds of Teneriffe onions have been purchased by the President and other members of the Society from the Agricultural Department for trial on their plots.

Every effort was made to encourage small planters to grow rice at Midlands where the climate and soil are suitable. Notwithstanding the very low rent and the cheap seeds placed at their disposal, none of them was willing to take advantage of the favourable terms.

A small demonstration plot of about one acre near Mahebourg Railway Station was planted with different food crops in order to propagate and distribute planting material to the inhabitants of the locality. Many applications were received.

School Gardens.

The thirty six registered gardens were regularly visited by Officers of the Agricultural Division and advice given to the Head Teachers, their staffs and pupils as to the best methods of sowing, planting, manuring, control of diseases and insect pests, etc. Short lectures on practical gardening were also delivered to the pupils. The majority of Head Teachers take a great interest in their gardens and do their best

to develop a bias for agriculture in the pupils. A new garden at La Caverne Church of England Aided School was started in November.

The Botanist and the Senior Agricultural Officer inspected all the gardens during the month of August in order to award prizes for the annual competition for the best kept School Gardens. Prizes were awarded as follows :—

1st prize of Rs. 45 to the Christian Brothers Aided School, Rose Hill.
2nd prize of Rs. 35 to the Plaine des Papayes Government School.
3rd prize of Rs 30 to the Bambous Government School.
4th prize of Rs. 25 to the Ruisseau Rose Government School.
5th prize of Rs. 20 to the Old Grand Port Roman Catholic Aided School.
6th prize of Rs. 15 to the l'Escalier Government School.

Six additional prizes of Rs. 5 each were given to the following gardens :—

Mahebourg Government School
Quatre Bornes Government School
Highlands Road Church of England Aided School
Belle Rose Roman Catholic Aided School
Souillac Government School
Poudre d'Or Government School

The following gardens deserve special commendation for their neat lay out, clean condition and nice collection of vegetables :—

Camp Diable Government School
Medine Camp de Masque Aided School
Brisée Verdière Church of England Aided School
Rose Belle Government School
Chemin Grenier Government School
Congomah Government School
Beau Bassin Government School
Clairfond Church of England Aided School

Allotment Plots.

A scheme to provide land to unemployed persons in order to enable them to grow food crop was inaugurated during the year. A Committee was appointed by Government with the Director of Agriculture as Chairman. Land was placed at the disposal of the Committee at Bois Marchand, Barkly, Floréal and Malherbe. Up to the end of the year forty seven persons had taken allotments and started work. The Department of Agriculture has distributed free seeds, tubers, and cuttings of various food plants to the allottees. Officers of the Department regularly inspect these plots in order to give necessary advice and encouragement. It has recently been decided to give free timber to the allottees in order that they might erect huts on their plots. No effort has been spared to make the scheme a success and progress made up to date is satisfactory.

C. A. O'CONNOR,
Senior Agricultural Officer.

II

BOTANICAL DIVISION

Sugar cane diseases.

During September, October and November a cane disease survey was conducted at the mill carriers of a number of factories representative of the several districts of the island. It was thus hoped to obtain more accurate information on the extent of spread of cane diseases than in former years, as it was considered that a small number of inspections per factory, spread over all the factories of the island, would give less reliable information than would much more frequent inspections per factory spread over a selected few, representative of the several districts of the island. The results of the survey will be found in the Appendix.

The remarks made last year as to the reliability which can be placed on these figures are also applicable this year.

Most reliability can be placed on the figure showing percentage of "stem deterioration," as this is purely a *stem* affection and it does not, so far as is known at present, *kill* the shoots as does red rot; so that all affected canes may be expected to be brought to the mill. It will be noted that there has been very little variation in this figure during the last three years as far as White Tanna (the cane most affected) is concerned.

Leaf Scald (caused by *Bacterium albilineans* Ashby).—Considerable difficulty has been experienced in the past in isolating *Bacterium albilineans* as it has been found to grow with reluctance on artificial media, even the peptone-saccharose agar of Wilbrink. By increasing the concentration of the organism in the culture medium, however, and by the addition of 0.05 g. anhydrous sodium sulphite to one litre of the culture medium (as a result of the findings of Messrs A. F. Bell and W. Cottrell-Dormer of Queensland), this organism has been isolated more readily than formerly, but it is still more difficult to isolate in pure culture than most other pathogenic bacteria.

It was stated in last year's report that some difficulty had been experienced in obtaining successful inoculations into cane tissues with pure cultures of this particular organism. During the year under review, however, many successful inoculations were obtained with pure cultures on cane shoots and cuttings.

A plot was laid out with varieties whose behaviour to scald in the field is known, the cuttings of which had been inoculated by means of an infected knife. The object of the experiment was to ascertain the efficacy of the method for the determination of the resistance of new seedlings to the disease. Up to the present five out of the six varieties under test have responded to the inoculation in accordance with their known behaviour to scald in the field. The single exception is D.K. 74, in which scald symptoms appear in a high percentage of shoots emerging from cuttings artificially inoculated with an infected knife, but which is apparently *highly* resistant to the disease in the field. Observations have also been made in this plot with the end in view of determining whether or not scald symptoms are likely to become evident during the cooler months of the year (when growth is slower) in shoots which were previously healthy. Only two shoots have, up to

date, exhibited symptoms during the winter months after having been apparently healthy previously. It would appear, therefore, that this peculiarity of the disease, recorded from Australia, is not exhibited here. The temperature this year may not have been low enough, however, to cause a check in growth sufficient to bring out scald symptoms in shoots in which the disease was latent.

Gumming (caused by *Bacterium vascularum* (Cobb) G. Smith).—A plot was laid out towards the end of 1931 on the lines devised by Mr. D. S. North to test the resistance to gumming of a number of 1931 seedlings, and some seedlings bred in previous years, (M. 2316, M. 2416, M. 2016, M. 2716, M. 117, M. 3517, M. 522, M 1426, M. 130. M. 530, M. 730, M 830, M. 1030, M. 1130, M. 1330, M. 1630) two of which are already under cultivation on estates. 55/1182 was the variety used for the border rows. The 1931 seedlings were grouped according to their parentage (following the suggestion of Mr. N. Craig, at that time acting officer in charge of the Sugarcane Research Station) to obtain information as to whether or not resistance or susceptibility to the disease is handed down to their progeny by certain crosses. The individual seedlings showed at reaping time striking differential response to gumming, but there was on the whole no consistency in disease resistance amongst the progeny of any particular cross of *nobile* canes. In the progeny of crosses where wild blood had been introduced, however, there was consistent high resistance to gumming. This plot gave also valuable information as to the resistance of the seedlings to leaf spotting caused by *Cercospora longipes*, Butl.

The other seedlings tested can be listed as follows with regard to their reaction to gumming :—

M. 2316 moderately resistant to resistant,
M. 2416 susceptible,
M. 2016 moderately resistant to resistant,
M. 2716 moderately resistant,
M. 117 highly resistant to immune,
M. 3517 highly resistant,
M. 522 highly susceptible,
M. 1426 highly resistant to immune,
M. 130 highly resistant,
M. 530 moderately resistant,
M. 730 susceptible,
M. 830 highly resistant,
M. 1030 highly resistant to immune,
M. 1130 highly resistant to immune,
M. 1330 highly resistant to immune,
M. 1630 highly resistant to immune.

Another gumming resistance trial plot has been planted out with *cuttings* of 1930 and 1931 seedlings. Three cuttings of each seedling have been planted.

Degrees of resistance to gumming of some seedlings now under cultivation on a field scale, and others in trial rows on estates were recorded. M. 2916 and M. 109/26 on a field scale on two estates have been found to exhibit a higher degree of susceptibility than they were

formerly thought to possess, and advice has been given to discontinue the further propagation of the former. M. 109/26 gives such good yields on estates in the higher parts of the island, in spite of a high percentage of shoots killed by gumming, that planters in these localities are thought to be justified in propagating this variety cautiously until a variety or varieties, just as well or better suited to their estates and highly resistant to gumming, can be offered them.

Experiments conducted during the year have shown consistently that the use of infected cane cutting knives is a ready means of propagating this disease.

Experiments were carried out by the Scientific Assistant by means of injection of a filtrate of liquid cultures of Bacterium vascularum (passed through a Pasteur-Chamberland filter, with the assistance of the Bacteriological Laboratory) into healthy cuttings to determine whether or not the etiolation in the leaves of some gumming affected shoots can be produced by an excretion of the organism in the absence of the latter. These experiments have yielded negative results.

So-called "Fourth Disease."

Results of attempts at isolating a pathogen from diseased leaf material were inconclusive.

A plot was laid out towards the end of 1931 with apparently healthy P.O.J. 2878 cuttings (a rather susceptible variety) taken from a field heavily affected with the disease to determine whether or not "fourth disease" would reappear in the shoots from these cuttings. A control plot was planted with cuttings selected from an entirely healthy field. At the time of writing—about fifteen months after the cuttings were planted—the disease symptoms have not appeared on the shoots in either plot. Symptoms of "fourth disease" failed to appear in shoots inoculated with a suspension of diseased leaf tissue in water.

A severely affected stool was observed in a plot of P.O.J. 2878. Cuttings prepared from these shoots were planted. Some weeks after one of the planted cuttings was found to be yielding one shoot only, the others having died. This shoot was examined when very young (it died soon afterwards) and there was on it only one fully expanded leaf, which was exhibiting a distinct chlorotic streak extending partially up the blade. The experiment will be repeated.

Root rot of young seedlings.

A *Pythium* sp. isolated from diseased roots of young seedlings was identified at the Imperial Mycological Institute as probably *P. graminicolum* Subram., apparently identical with Carpenter's cane root *Pythium* in Hawaii.

A fungus thought to be *Rhizoctonia* sp., isolated from roots of young seedlings, was identified at the Imperial Mycological Institute as probably belonging to the form genus *Moniliopsis*. It was found to have the hyphal characters of strains of the *Corticium solani* group, but there was no inclination to form sclerotia, and it did not take on a dark colouration.

Information regarding the incidence of the other sugar cane diseases will be found in tabular form in the Appendix based chiefly on reports of the Plant Inspector.

Diseases on other plants: *Tobacco* (*Nicotiana Tabacum* L.)

Mosaic was again this year very seldom encountered. Granville wilt (caused by *Bacterium solanacearum* E. F. Smith) also caused no appreciable losses. Amarello, the chief variety cultivated at present seems highly resistant to this disease.

Pythium sp. was found in association with "damping-off" of tobacco seedlings. In this case the disease seemed to have been aggravated by overcrowding of the seedlings.

A heavy leaf spotting of tobacco seedlings and young plants in the nursery was investigated. No causal organism was discovered. A fungus was obtained in artificial culture, but it did not sporulate. The beds were all sprayed with Burgundy mixture and Bouisol (a colloidal copper spray sold by Messrs. W. J. Craven & Co. Ltd., Evesham, England) under the Mycologist's supervision, after which the disease disappeared. As the manager of the estate was anxious about the disease, and was thus unwilling to leave some beds unsprayed as controls, no definite conclusion can be drawn that the spraying caused the disappearance of the disease.

Investigations were carried out on an unknown tobacco disease at the La Ferme Experimental Station, marked by chlorosis (resembling strongly mosaic symptoms) and abnormal growth. Results of inoculation experiments indicated that some of the cases of the disease or diseases in question, as far as chlorosis was concerned, were of virus origin. The abnormal growth (characterised chiefly by the greater development of leaves on one side of the plant) is likely to be due to nutritional factors, but definite proof of this is still lacking.

Some types of chlorosis of tobacco at La Ferme seem to be due to environmental conditions. A young plant in a seed bed, suffering from a form of chlorosis in which the lighter coloured areas were *yellower* than in most types of mosaic and the darker green areas were found chiefly along the main lateral veins, was transplanted to a pot of fresh soil at Réduit. After about one month growth in this pot the chlorotic symptoms disappeared.

The disease causing most losses to the tobacco crop is "black shank" (caused by a strain of *Phytophthora parasitica* Dast. emend. Ashby).

A number of different varieties of tobacco were planted in infected land at La Ferme as a resistance trial plot. In August two plants of Yellow Pryor and one plant of Hester were found infected. This plot will be replanted and observations continued during the summer months, when the disease is more likely to appear.

In the summer crop from September to the time of writing loss from "Black shank" has been reduced by abandoning the practice of applying pen manure to nursery beds and fields. It is hoped that by eliminating pen manure and rotating tobacco with other crops "black shank" losses will be eventually reduced to a minimum.

Pineapples (*Ananas sativus* Schult.)

A *Penicillium* sp. was isolated from tissues affected with the dark brown to black dry rot of fruit reported last year. Healthy fruits were inoculated with the fungus with negative results. A top rot of the

fruit, which apparently starts at the bases of the crown leaves, was also investigated. A bacterium was isolated which was used to inoculate healthy plants. Negative results were obtained

Towards the end of the year a heart rot of pineapple plants was discovered with symptoms which seemed identical with those of the *Phytophthora* "heart" rot reported from other countries. A survey was made of all pineapple plantations in the company of the Senior Agricultural Officer. The disease appears to be most prevalent where the plants are growing under adverse environmental conditions. Planters have been urged to cut out and destroy all affected shoots as soon as they are discovered, and to spray with Burgundy mixture if the disease continues to be troublesome. A plot has been laid out at the Central Experimental Station for the investigation of pineapple diseases.

Potatoes (*Solanum tuberosum* L.)

An experiment was conducted to compare the effectiveness of Burgundy mixture with that of Bouisol and Cupryl Powder (the first a colloidal copper spray and the second a copper dust sold by Messrs. W. J. Craven and Co. Ltd., Evesham, England) in the control of blight—caused by *Phytophthora infestans* (Mont.) de Bary. A plot of about 1/7th acre was planted with potatoes and divided into eight sections. Each of the three fungicides was applied at about eight day intervals to two sections. Two sections were left untreated as controls. Four applications of each of the sprays and three applications of the dust (owing to the supply having run short) were made.

The result of the experiment was as follows:—
Control plots yielded 25 kilos,
Burgundy sprayed plots yielded 48.6 kilos,
Bouisol sprayed plots yielded 28.1 kilos,
Dusted plots yielded 24.9 kilos.

The failure of the dust to control the disease was probably in large measure due to the inefficient duster available for the experiment. A more efficient machine is being obtained for further experiments.

The Bouisol treatment resulted in very poor control of the blight. It has since been found, however, that the dilution at which it was applied was much too great. A further experiment will be conducted using the compound at a greater concentration.

The attention of the Mycologist was drawn to a disease attacking potato tubers in the field in September. The crop originated from Australian "seed". The tubers were large and apparently of good quality except for a slight superficial, unsightly scabby growth which reduced considerably their market value. It is suspected that the disease is the common potato scab. No causal organism has yet been discovered.

The pH of the soil in which the potatoes were growing was found by the Assistant Chemist to be 6.4.

Coconut (*Cocos nucifera* L.)

A Phytophthora was isolated from a bud rot affected coconut tree. This *Phytophthora* was identified by Mr. S. F. Ashby of the Imperial Mycological Institute as a typical strain of *P. palmivora* Butl. in the

"rubber" group. It is in the same group as coconut *Phytophthora* strains in Jamaica, Porto Rico and the Philippines, according to Mr Ashby. Inoculation experiments with the organism have not yet led to positive results.

Maize (*Zea Mays* L.)

A bacterial disease of this plant, marked by a white striping of the leaves and the exudation of gum from the stem, was discovered and investigated by the Scientific Assistant. A bacterium, which proved to be pathogenic, was isolated. A culture of the organism was despatched to the Imperial Mycological Institute. A report from Mr. S. F. Ashby stated that the organism differs from all pathogens hitherto described from maize. Cultures have been sent by him to Dr. Charlotte Elliot in Washington.

Other diseases of maize encountered were streak, stripe and a rust.

Beans (*Phaseolus vulgaris* L.)

An experiment was conducted on the control of bean mosaic in Government House vegetable garden, where the disease has in the past resulted in great losses. One plot (A) was watered once a week with a mixture of coaltar in water (one pound of tar melted in two gallons of boiling water, and the mixture diluted to about 100 gallons). Another plot (B) was watered once a week with water in which *Furcraea* leaves had been crushed. These liquids were applied as insect repellents, it being assumed that bean mosaic is transmitted by sucking insects.

A third plot (C) was left untreated as a control.

No disease developed in plot A.

Five diseased plants were removed from plot B.

Fifteen diseased plants were removed from plot C.

Had the diseased plants not been "rogued" out as soon as they were discovered, probably more disease would have developed in each of the plots B and C.

The experiment points to the conclusion that the coaltar mixture is an efficient insect repellent, and that its application is apparently effective in the control of bean mosaic. Experiments on the mechanical transmission of the bean mosaic to tobacco gave negative results. Soil transmission experiments on bean mosaic also gave negative results.

"Anthracnose" caused by *Gloeosporium lindemuthianum* (S. & M.) B. & C. was discovered on the variety Sutton's Golden Wax Pod.

Jak Fruit (*Artocarpus integrifolia* L.)

A rot with which *Rhizopus* sp. was found associated.

Pipengaille (*Luffa acutangula* Roxb.)

A rot of the fruit with which a *Phytophthora* sp. was found associated. It was identified by Mr. S. F. Ashby as a strain of *P. parasitica*. Portions of diseased fruit tissue were inoculated into healthy tobacco plants with positive results.

Snapdragon (*Antirrhinum* sp.)

A collar rot—with which is associated *Phytophthora* sp.—a *P. parasitica* strain, according to Mr. S. F. Ashby.

Zinnias and *Dahlias*.

A wilt, thought to be caused by *Bacterium solanaccarum* E. F. Smith. The exudate from the Zinnia roots inoculated into young tobacco plants resulted in the death of the latter.

Tomatoes (*Lycopersicum esculentum* Mill.)

Blight (*Phytophthora infestans*) (Mont.) de Bary.

Peas (*Pisum* sp.) Mildew (*Erysiphe polygoni* DC.)

Leaf spot (*Ascochyta pisi* Lib.)

Kyllinga spp.—Rust—unidentified.

Investigations were conducted, in conjunction with the officers of the Entomological Division, to determine the cause of and find a remedy for destruction of lawn grasses. Results of preliminary investigations point to the conclusion that caterpillars (*Crambus* sp.) attacking the lawn grasses chiefly when they are weakened by environmental conditions, are the principal causes. Improvement has been effected on lawns and golf greens by dressings of ammonium sulphate and ferrous sulphate (about three pounds of each per 1,000 sq. ft. of surface), and spraying with lead arsenate in water.

Investigations are in progress at the Central Experiment Station and elsewhere to determine the effect of dressings of ammonium sulphate and ferrous sulphate on weed growth in lawns. One of the principal limiting factors to luxuriant growth of lawn grasses here is a creeping weed, *Linaria Cymbalaria*, Mill.

Other duties included disinfection of imported consignments of tea and tobacco seed, supervision of the inspection of imported and exported plants, and lecturing in Botany and Mycology at the College of Agriculture.

During the year a leaflet on the diseases of garden crops and fruit trees was written by the Botanist and Mycologist. A "Preliminary List of Plant Diseases," compiled by the Botanist and Mycologist, was published early in the year.

The valuable assistance of the Director and Mycologist of the Imperial Mycological Institute, in the identification of specimens submitted to them, is gratefully acknowledged.

E. F. S. SHEPHERD,
Botanist and Mycologist.

III

SUGAR TECHNOLOGICAL DIVISION

Visits to factories, investigations, etc.

During the grinding season, the Sugar Technologist visited all the factories of the Colony, with the exception of three, some of them repeatedly and some also during the off season. On many occasions he was accompanied by the Assistant Sugar Technologist. Advice was given and experiments carried out.

Dry crushing.

Dry crushing tests were carried out in a few factories with a view to determining the sugar extraction of each unit in a tandem of mills. Many practical difficulties were met with during these experiments, in spite of valuable assistance given by the Factory and Laboratory Staffs. It was possible however, to draw some conclusions and to detect defects in the efficiency of one or two mills in tandems. The results seem to show that in a tandem of mills of the same efficiency, the sucrose of bagasse decreases by an equal figure after each unit, or in other words, when plotted on a graph, the line connecting the sucrose content of the bagasse of each mill in a tandem, should be a straight line. Deviations show overloaded or underloaded units. In these determinations, valuable help was obtained from the Engineering Staff of Forges Tardieu, Ltd.

Sulphurous acid in raw sugars.

Determinations of the SO_2 content of several raw sugars, were made. The back titration method (Iodine and Thiosulphate standard solutions) proved to be of no value in these determinations, sugars manufactured without any sulphurous acid having given a positive reaction, whilst the official distillation method proved those sugars to be free of any SO_2. This method of analysis was applied to samples from other factories; some of them contained more than 70 parts of SO_2 per million—the maximum limit permitted by the New Public Health Regulation, 1927. As these sugars are all refined and never go direct to the trade, their percentage in SO_2 should not matter, the refining processes ridding them from any SO_2 they may contain. To be on the safe side, however, the manufacturers should pay more attention to that question. Our investigations have proved that an acid reaction of the clarified juice, in sulpho-defecation, tends to produce sugars with a certain percentage of SO_2, whilst a neutral or better a slightly alkaline reaction produces sugars without any or hardly any SO_2.

This division has recommended the suppression of SO_2 for the manufacture of raw sugars, whenever the settling and filter press capacities are convenient. A few more factories have applied this recommendation successfully. In some cases, the use of phosphoric acid instead of SO_2 has given good results. Experiments were carried out in one factory, to the satisfaction of the Manager who decided to take steps for the substitution of P_2O_5 for SO_2 next crop.

Phosphoric acid content of juices.

In connection with the substitution of P_2O_5 for SO_2, investigations were started on the percentage of P_2O_5 in mill juices and its correlation with clarification. Preliminary work was done, the micro determination method of Deniges as modified by Truog and Meyer, was adjusted for local conditions using the Hellige disc comparator. A certain number of determinations made on juices of the same cane variety from different fields show great variation in the P_2O_5 content. A programme of study is being elaborated for next crop.

Curing of sugars.

The installation of superheaters for the steam used in the centrifugals was made in a few factories with satisfactory results. A high polarization and a drier sugar were obtained with less steam than when saturated steam was employed. This practice will, no doubt, generalize rapidly.

Industrial alcohol and Cernite.

A study of the use of these locally produced fuels in internal combustion engines, in comparison with motor spirit, was made by the Assistant Sugar Technologist. The results are being published as a leaflet of this Department in English and in the Revue Agricole in French.

Controle Mutuel and Factory results.

Thirty six factories contributed to the "Controle Mutuel" and returns were regularly distributed fortnightly amongst contributors.

For the first time since the organization of the "Controle Mutuel", the final figures for the 42 factories were received as early as during the month of January through the courtesy of the managers.

The percentage of sucrose in the cane was much below normal at the beginning of the crop in the low lying districts—particularly so in the north of the Island—and above normal in the central districts. The average for the crop was better than for the last three years, as may be seen from the following table :—

	True mean	Arithmetical mean			
	1932	1932	1931	1930	1929
Sucrose % cane ..	13.06	13.04	12.73	12.97	12.89
Purity of 1st mill juice ..	...	86. 8	86. 4	87. 1	86. 5
Mill extraction ...	94. 5	94. 5	93. 7	94. 4	94. 1
Recovery ...	89. 1	89. 1	88. 1	89. 2	89. 0
Overall recovery ...	84. 3	84. 2	82. 5	84. 2	83. 8
Sugar extracted % cane ...	11.01	10.99	10.51	10.91	10.81

Some of the highest average sucrose figures % cane for the crop were obtained in factories where White Tanna is by far the ruling variety: Mon Désert, Alma, Trianon, Britannia, etc.

B.H. 10/12 is gaining favour in the low-lying districts. This variety was imported by the Department of Agriculture at the request of the late manager of Labourdonnais several years ago. It took a long time to acclimatise and is now the leading variety amongst all those tried lately on an industrial scale. Its sucrose content during the crop, was higher than that of any other cane milled at the same time. Its juice is pure and its bagasse as fuel, compares favourably with that of any other cane.

Mill extraction and recovery were better than last year, the cyclone of April 10th does not seem to have had any effect on the quality of the cane.

Sugar extracted % cane was the highest on record.

The proportion of raw sugar was 87.5% of the total production. This figure is also the highest on record.

Educational.

Through the reversion to the three years course and the consequent changes in the curriculum of the College of Agriculture, lectures were delivered by the Assistant Sugar Technologist to the first and second years students in Mechanical Engineering, Building Construction and Surveying during the last term of the scholar year only (January to April). The Sugar Technologist delivered lectures to the same students in Sugar Cane Agriculture, Sugar House Chemistry and Sugar Technology during the same term. He lectured in the two last mentioned subjects to the 2nd year students during the two first terms of their scholar year (April to December). The lectures were followed by practical demonstrations and laboratory work.

The students visited sugar factories and estates repeatedly with the Sugar Technologist and his Assistant during the off season and during the crop for practical demonstrations.

Miscellaneous.

Articles were written for the Revue Agricole by the Sugar Technologist and by his Assistant.

The Sugar Technologist acted as Honorary Secretary to the Board of Directors of the Mauritius Institute and as Secretary of the Sugar Industry Reserve Fund Committee.

LOUIS BAISSAC,
Sugar Technologist.

IV

VETERINARY DIVISION

Importation of Animals.

	From Foreign Countries		From Dependencies	
	1932	1931	1932	1931
Cows and Oxen ...	3,307	4,574	310	391
Horses ...	2	12	3	4
Sheep ...	142	30	734	900
Goats ...	...	...	2,108	2,988
Pigs ...	..	70	1,840	2,205
Mules ...	...	...	5	...
Donkeys ...	...	...	1	2
Turtles ...	118	...	200	10

Six dogs have been imported and kept under 6 months observation in the Government Kennels; as ninety seven sheep were received without veterinary certificates they were kept under observation at the Animal Quarantine Station and subsequently delivered to their owners.

Contagious Diseases : Surra

7,403 animals were examined, 27 cases were detected (ten less than in 1931) amongst which there were 3 on equines and according to regulations they have been destroyed. Affected bovines were treated with Atoxyl and Arsenious acid and subsequently recovered; 2 cases among them relapsed.

Tuberculosis.

133 bovines of the milch breed were treated with tuberculin ; the method used being the subcutaneous one ; the results obtained were 3 positive reactions and 3 doubtful. The affected animals were destroyed and the doubtful cases are under observation.

B. C. G. Vaccine.

The number of doses delivered was 1,492 against 1,076 in 1931. The local herds are improving so markedly since the application of this vaccine that great hope can be entertained as to the eradication of bovine tuberculosis in Mauritius.

Red Water.

A serious outbreak of "Red Water" was detected on a herd of 60 head, trypan blue injections were immediately carried out very successfully and no death was recorded.

Poultry Diseases.

"Infectious Coryza" was reported to cause damage in a poultry yard, the disease was prevailing in an acute form. Out of 18 birds treated with copper sulphate solution 50% recovered. Numerous deaths amongst poultry having been reported immediate investigations were made and "Fowl Cholera" detected; about 90% of the subjects were dead. Appropriate disinfection together with sulphocarbolate solution in drinking water were given to birds of the vicinity with successful results.

Government Animals.

Animals, the property of Government, were regularly attended. Two mules recovered from lameness, one donkey attended to from accidental wounds, one bullock died of enteritis and one donkey treated for laminitis.

Report of death.

87 deaths of animals have been reported during the year. Surveys have been made in the villages where these deaths occurred with a view of ascertaining the cause. In several cases "Surra" was detected in the vicinity.

Cases of Cruelty.

About twenty animals were examined at the request of the Police Department for cruelty on animals, several owners have been prosecuted and fined.

Meat Inspection.

Surprise visits were made to the different abattoirs. On two occasions carcases seized were maintained. Eighty one cows and heifers under age have been examined and allowed to be slaughtered owing to sterility, humanitarian reasons and unfitness for reproduction.

Government Dairy.

One cow suffering from Antepartum paralysis was attended to and subsequently discarded. Five others were attended to for "Metritis" and "Mammitis" and another one for chronic meteorisation. Twelve cases of abortion were recorded against twenty one last year. Vaccination was applied regularly weekly, fortnightly and monthly according to the different batches in which the cows were placed.

College of Agriculture.

Courses of lectures were delivered once weekly to the first year students and were well attended to.

F. E. LIONNET,
Govermnent Veterinary Surgeon.

V

ENTOMOLOGICAL DIVISION

The Campaign against Phytalus Smithi, Arrow.

As the Phytalus season (i.e. the period of the emergence of the beetles) commences in October one year and terminates in March of the following year, the report on the campaign is written to cover the period of the financial year (i.e. July 1st in one year to June 30th in the following year). As this report has not the same wide circulation as the annual report of the Department it is advisable to give here a summary of the 1931–32 Phytalus operation and to add, as well, a short description of the trend of Phytalus events since July 1932.

During the year one new centre of infestation was detected at Grand Port and comprised part of the following estates :—Beau Vallon Rochecouste, Plaisance and Mon Désert Carié. The total area supposed to be infected at present is approximately 67,000 acres distributed as follows :—

Pamplemousses and Rivière du Rempart ...	36,500	acres
Flacq	8,200	,,
Moka	9,000	,,
Plaines Wilhems	4,000	,,
Grand Port and Savanne	9,300	,,
	67,000	,,

The spread of Phytalus since 1911 is illustrated by means of the map displayed in the Appendix.

During 1931–32, 356,876,727 beetles were destroyed as compared with 324,440,016 in 1930–31 or an increase of 32 millions. This increase is more apparent than real for in 1930–31 63 millions larvae were destroyed whilst in 1931–32 no larvae were destroyed. This decision to cease the destruction of Phytalus larvae was taken at a meeting of the Phytalus Advisory Committee held on the 29th May 1931 as, through the destruction of the larvae, a great number of beneficial parasites were also destroyed.

The total number of Phytalus destroyed during 1930-31 and 1931-32 is given in the following statement:

Season	Beetles collected	Larvæ collected	Totals
1930-31	324,440,016	63,995,356	388,435,372
1931-32	356,876,727	None	356,876,727

or a difference of some 32 millions of Phytalus *in favour of* 1931-32.

The following table gives the number of Phytalus destroyed for the past five years:—

Season	Beetles collected	Larvæ collected	Totals
1927-28	134,902,940	20,935,385	155,838,325
1928-29	252,613,173	99,187,660	351,800,833
1929-30	265,364,772	137,463,592	402,828,364
1930-31	324,440,016	63,995,356	388,435,372
1931-32	356,876,727	None	356,876,727

It will be noticed that in 1930-31 and 1931-32 decreases have been recorded in the number of Phytalus destroyed.

The amount spent on beetle purchases in 1931-32 was Rs. 83,517.83 and the total cost of the operations was Rs. 98,461.97.

Diagrams in the Appendix give, in a graphic form, the monthly captures of beetles for the last five years and the total number of Phytalus destroyed since the beginning of the campaign as well as the cost of the operations.

The usual survey on Estates to ascertain the degree of infestation in the various centres was carried out on the same lines as in previous years.

The following table gives the number of Estates surveyed in each centre and the number of estates on which increases or decreases have been recorded during 1931-32 as compared with 1930-31.

Centre	No. of estates surveyed	No. of estates on which 1. increases 2. decreases have been recorded				Estates on which infection is stationary	Fresh areas	No. of Estates surveyed	No. of estates on which 1. increases 2. decreases have been recorded				Estates on which infection is stationary	Fresh areas
		Increases		Decreases					Increases		Decreases			
		Light	Marked	Light	Marked				Light	Marked	Light	Marked		
Pamplemousses and Rivière du Rempart ...	32	2	7	5	14	4	...	39	9	7	6	10	2	5
St. Julien	11	1	5	3	...	...	2	11	5	1	1	3	1	...
Sébastopol	8	3	2	1	1	1	...	8	2	3	...	...	2	1
Moka	13	1	2	3	2	3	2	14	5	2	3	4	...	...
Plaines Wilhems ...	8	4	1	2	1	...	...	15	3	3	2	2	1	4
Grand Port and Savanne..	18	8	6	2	1	1	...	23	5	3	4	7	...	4
Totals	90	19	23	16	19	9	4	110	29	19	16	26	6	14
% estate surveyed ...	...	21	25	18	21	10	...	...	26	17	14	24	5	...

The natural enemies of Phytalus, *Tiphia parallela*, Smith and *Elis thoracica*, Fabr., were recorded in fair numbers in certain areas.

Researches made with a view to ascertaining the percentage of parasitism of Phytalus by Tiphia and Elis in the various centres gave the following results :—

Centre	Tiphia parallela, Smith			Elis thoracica, Fabr.		
	Maximum	Maximum	Average	Maximum	Maximum	Average
	%	%	%	%	%	%
Pamplemousses and Rivière du Rempart ...	26.4	0.9	9.9	11.8	0.9	5.0
Moka and Plaines Wilhems..	44.0	3.8	23.0	6.7	0.3	0.4
Sébastopol	13.7	9.6	4.2	2.3	0.1	0.2
Savanne	15.5	1.5	5.3	...	...	...
St. Julien	3.3	0.9	0.6	7.2	0.3	0.5

As a result of recommendations made by the Financial Commissioners the conduct of the Phytalus Campaign during 1932–33 has undergone a great change.

The Commissioners were of opinion that the cost of the campaign should be borne, in toto, by the planting community and recommended that Government should cease its contribution from the Improvement and Development Fund. From July 1st 1932 Government ceased its contribution and the funds available for the campaign now read thus :—

Rs. 47,000 as proceeds of a special export duty on sugar of 2 cents per 100 Kilos, Rs. 13,000 from Agricultural College Funds and Rs. 3,000 from the Sugar Industry Reserve Fund.

The various Phytalus offices were closed and a scheme for the 1932–33 campaign was proposed by Mr. de Speville, Manager of Mon Désert Estate, St. Pierre. The scheme consists in the selection, in each Phytalus centre, of a certain number of sugar estates whose duty it is to receive and destroy the beetles captured in their vicinity and to effect the necessary payments according to rates approved by the Director of Agriculture. These estates are subsequently re-imbursed from the funds described above. The operations are made under the responsibility of the Manager of the Estate. It has also been decided that the general supervision of the campaign would rest with the Department of Agriculture and to this effect the services of two Phytalus Officers were retained by Government. The new arrangement is working satisfactorily.

Research. (A) *Experiments with Cyanogas against Phytalus.*

At the request of the American Cyanamid Sales Company further trials were made with two grades of Cyanogas : the flake form and the granular form. It results from the experiments carried out in the different localities of the Island that the highest percentage of mortality reckoned was 20% when the Cyanogas, in flake form, was applied at the

rate of 6 grammes per stool of cane and sprinkled on the infested stool after removal of earth and subsequent replacing of same. The cost of the insecticide and the application worked out approximately to Rs. 40 per acre. Application was not made in the interlines where larvæ occur to some extent.

Owing to the rather low percentage of mortality obtained and the high price of this insecticide, it was found that no hope whatever could be entertained of controlling Phytalus economically and efficiently with this reagent in Mauritius.

(B) A series of experiments were carried out with the following scents, as possible attractants to adult Phytalus:

1. Geraniol
2. Eugenol
3. Linalyle acetate
4. Benzaldehyde
5. Essential oil from *Cordia interrupta* leaves
6. Fermented bagass
7. Ether and Alcohol extracts of sexual glands (female)

These scents were mixed in a bait composed of bran and molasses or bagasse and molasses which was placed in traps in infested cane fields at night. The results were negative in all the cases.

(C) The toxic effect of margoze plants in fields infested with Phytalus larvae was again tried on a large scale, the results were negative.

(D) The synchronism in the biology of Phytalus and its parasites was worked out on the same line as last year during the first six months of the year and had to be discontinued on account of the reduction of the Phytalus staff.

The graph as shown in the Appendix indicates the various sizes of Phytalus larvae throughout a year. It follows therefrom that the highest percentage of medium-sized larvae, upon which Tiphia can develop normally, occurs during the months of February to April.

By means of a diagram the synchronism existing between the life cycle of *Tiphia parallela*, Smith, and that of *Phytalus smithi*, Arrow, is shown in the Appendix. It results that when there is a maximum of adult female Tiphias in the field there is at the same time a minimum of Phytalus larvae susceptible to parasitism, the exception being during the month of February when Tiphia is abundant and there exists a fairly high proportion of medium-sized larvae. A great proportion of Phytalus larvae is in the pre-pupal stage from September to December, their chance of being parasitised by Tiphia is, therefore, remote.

An obvious case of superparasitism by Tiphia was noticed in some cane fields at Moka in December. It was also noticed during the same period that several Phytalus larvae of very small size were parasitised by Tiphia; it was obvious that the small size of the Phytalus larvae was insufficient to nourish effectively the Tiphia larvae and permit of their complete evolution.

(E) The life history of *Tiphia parallela*, Smith was worked out again this year during the hot and the cold seasons. It was found that the life cycle of this parasite was of 65 days in summer and of 102 days in winter, corroborating with the results already obtained last year.

(F) Experiments were continued on the breeding of Phytalus larvae in fresh and in rotten manure. It was found that Phytalus larvae could not breed in manure, most probably on account of the high temperatures developed in manure heaps.

(G) At the request of the Sugar Industry Reserve Fund an Entomological mission was sent to Madagascar for the search of parasites which might possibly be introduced into Mauritius for the control of Phytalus. A separate report was prepared and submitted in July. It results from this mission that an *Elis* species, common in some regions of Madagascar, was found and subsequently introduced into Mauritius. Some 2,332 alive insects were introduced from April to September. The life history of this new parasite has not been successfully worked out in the Laboratory owing to various factors beyond control in the insectarium.

(H) Experiments with various entomogeneous fungi received through the Imperial Bureau of Mycology have been started. The species under study for the control of Phytalus larvae in Mauritius are *Beauveria densa*, *Beauveria bassiana* and the green Muscardine fungus *Metarrhizium anisopliae*.

(I) After a decision of the Phytalus Advisory Committee, a species of Hedgehog, *Echinops telfairi* was imported from Madagascar. Some twenty six specimens were received in March and were kept under observation in the insectarium. Their bionomics have been studied and it results therefrom that, though they are insectivorous, no great hope can be entertained that they will be of great value as an enemy of Phytalus in Mauritius on account of their dormant habits which start from June and end in September, a period during which Phytalus larvae are most common in the cane fields.

Borer—Diatraea venosata, Wlk.—Late in the grinding season a borer survey was started on a new basis on the various estates of the island. The method of estimating the percentage of cane attacked by the spotted borer was the same as the one used in Porto Rico by Dr. Wolcott, that is by estimating the percentage of borers or borer holes per 100 lbs. of cane. It results from this survey that the average of borers per 100 lbs. of cane is 39. The percentage of nodes attacked by the spotted borer amounts to 10–25% which in some places of the island means a reduction in yield of about 15 tons per acre. The net loss due to the spotted borer, *Diatraea venosata*, Wlk., in the island was estimated at about Rs. 140,000, reckoning the reduction in the sucrose content of the cane at 2.3 or 16% sucrose of the sucrose in cane. A bulletin giving the status of the various borers in Mauritius has been prepared.

Insect pests of Pigeon peas, Cajanus indicus.—The life history of the major insect pests of this plant was studied together with the

toxicity, wetting and spreading power of various insecticides which might possibly be used to control these pests. The following table gives the results of the trial :—

Insecticides	*Results*
1. Linseed oil 3% with lead arsenate 0.2%	Scorching effect on foliage
2. Rosin wash alone ...	do
3. Rosin wash and lead arsenate	do
4. Bordeaux mixture, lead arsenate 0.2% Casein 0.2%	Plants not injured—adherence on leaves good
5. Copper carbonate 4%—Molasses	Plants not injured
6. Linseed oil 0.25%—Lead arsenate 0.7%	Defoliating effect
7. Soap 0.25%—Lead arsenate 0.7%	Defoliates and kills the plants
8. Flour 0.17%—lead arsenate 0.7%	Defoliating effect
9. Burgundy mixture—Paris green 0.05%	Plants not injured—adherence on leaves good
10. Paris green 1 part, Slaked lime 6 parts } dusted	Adherence on pods good, but distribution difficult and there is a scorching effect on the foliage
11. Burgundy mixture and Paris green 0.1%	Plants not injured, protected the pods to a certain extent from insect attacks

It results from the above that Bordeaux or Burgundy mixture and Paris green or lead arsenate is the best spray to be used on pigeon peas

Fruit flies (*Dacus ciliatus*, Lwe. & *Tridacus d'Emmerezi*, Bez)—During the year, these flies were studied to see their response to various scents and baits. Their tropism was first tried in the laboratory in a type of chemotropometer as devised by F. Folsom in the Journal of Economic Entomology Vol. 24 (1931) and afterwards in the field. The results of the various scents and baits used were as follows :—

1. Geraniol and fermented bran	No result
2. Eugenol and „ „	
3. Benzaldehyde and „ „	
4. Linalyle acetate „ „	
5. Essence of vanilla and Scrubbs Ammonia	
6. Treacle, Borax, Arsenious oxide and fermented hominy chop	Attracted a few *Tridacus*
7. Syrup of Cucumber and sodium arsenite ...	No result

Lawn Cutworm (*Crambus emmerezellus*, Joan.)—Experiments were carried out in various places over the island jointly with the Botanical and Mycological Division. It follows therefrom that the cause of death of grass in the various lawns is not entirely due to the cutworm but, coupled with this insect, sometimes fungus attacks occur or the soil conditions of the lawn are unsatisfactory. An application of Paris Green or Lead Arsenate followed by one of Cheshunt Compound showed signs of checking the pest and diseases of lawns. In other cases the improvement of the soil conditions by the application of Ferrous Sulphate and Sulphate of Ammonia has had some success. Light traps for capture of adults were tried but the results were negative.

Termites.

A study of the bionomics of the Termites of Mauritius has been started at the end of this year and various useful data have already been obtained which will be published later as a Bulletin of this Department.

Mango Cecidomyid fly (*Procontarinia matteiana, Kieff.*).

The life history of this insect was studied and experiments were carried out with various substances which might act as a repellent. Tar water (1lb. coaltar boiled in 2 gallons rain water then diluted to 60 gallons), soap and carbolic acid etc. were sprayed on young plants in an infested orchard. The results showed that tar water acts to some extent as a repellent.

A survey has been performed respecting the incidence of this insect pest on various varieties of Mango in the island.

Miscellaneous work.

The other activities of the Division consisted in the following :

(*a*) Examination of plants, fruits and seeds at Customs.
(*b*) Examination of goat manure from Rodrigues.
(*c*) Destruction of insect pests of books at the Bacteriological Laboratory.
(*d*) Capture and liberation of parasites of *Aspidiotus destructor*, Sign. in various parts of the island.
(*e*) Reception, examination and liberation of parasites from Madagascar.
(*f*) Visits to various planters re advice on methods for controlling insect pests.
(*g*) Perusal and card-indexing of the literature of the year.
(*h*) Experiments with various insecticides manufactured locally or abroad.
(*i*) Monthly visits to the various Phytalus receiving centres of the Island during the collecting season and night inspections at the same time.
(*j*) Preparation of photographs for illustration of Bulletins.

The following insect pests occurred during the year and advice of their control was given to those concerned :—

Insect pest	Host	Locality	Month	Remarks
Agrotis ypsilon, Rott. ...	Manioc .	La Laura ...	January ...	Poison bait with Paris green. The Mynah bird was a powerful agent of control.
Praeconarinia malteiana, Kieff.	Mango ...	Beau Bassin	„ ..	Coal tar water used as repellent.
Crambus emmerezellus, Joan.	Lawns ...	Vacoas ...	February & March	Application of Cheshunt compound followed by a spraying with lead arsenate.
Dacus ciliatus Lw. and Trirhcus emmerezi, Bez.	Pipengaille & Sechium edule	Vacoas and Beau Bassin	February ...	Outbreak not very important at that time Trials for control with poison baits perfumed with possible attractants.
Gryllotalpa africana, P. de B.	Tobacco seedlings	Riche Terre	„ ...	Poison bait with Paris green.
Prodenia litura, F. ...	Pois Mascate	Plaisance ...	April ...	Invasion on 25 acres which were destroyed before any method of control could be applied.
Eutermes sp. ...	Timber ..	Garrison Hall	May ...	Nest fumigated with Cyanogas. A part of the colony was destroyed. Queen found alive in a crack of wood.
Sitodrepa panicea, L. ...	Books ...	Réduit ...	„ ...	Fumigation with Cyanogas.
Crambus emmerezellus, Joan.	Lawns ...	Vacoas ...	June ...	.....
Aphis gossypii, Glover ...	Voehmes ...	G.R.N.W....	„ ...	Tobacco decoction spray.
Maruca testulalis, Geyer	Cajanus indicus	Réduit ...	July ...	Attacked pods.
Cratopus spp. ...	Tung oil ...	Réduit ...	„ ...	Lead Arsenate and Lead Chromate sprays.
Elachista sp. ...	Sweet Potato	Montagne Longue	„ ...	Paris green spray.
Thrips tabaci, Lind. ...	Onion ...	Trou d'Eau Douce, Palmar	July, August	Tobacco decoction spray.
Crocidolomia binotalis, Zell.	Pet-Sai ..	G.R.N.W....	August ..	Watering with weak solution of Potassium permanganate, spraying with soap solution.
Agrotis ypsilon, Rott. ...	Potato ...	St. Aubin	September ...	Bored the tubers to some extent.
Phthorimaea operculella, Zell.	Tobacco ..	Anna ...	November ...	Parasitism very slight.
Crocidolomia binotalis, Zell.	Cabbages ...	Ebène ...	„ ...	As a trial sprayed with Eucalyptus decoction.
Cratopus (?) angustatus, Boh.	Cryptomeria plants	Curepipe ...	„ ...	Spraying with Paris green and Bordeaux mixture.
Bruchus chinensis ...	Phaseolus beans	Moka ...	„ ...	.....
Bronthispa limbata, Waterh.	Palm trees...	Alma ...	„ ...	Spraying with Lead Arsenate. Poison baits (bran and bagasse).

The following table gives the insects or other organisms submitted for identification during the year :—

Insects	Host	Identified by
Eccoptopterus scæpinosus, Mots. (Col. Scolytidæ)	Timber	Imperial Institute of Entomology.
Luperodes quaternus, Fairm. (Col. Galerucidæ)	Beans (Leaves) ...	„ „
Campsomeris grandidieri, Sauss. (Hym. Scoliidæ)	Lachnosterna spp. (from Rodrigues)	„ „
Opius liogaster Szepl. (Hym. Braconidæ)	Agromyza phaseoli, Coq. ...	„ „
Tetrastichus sp. (Hym. Eulophidæ)	Procontarinia matteiana, Kieff.	„ „
Cirphis loreyi, Dup. (Lep. Noctuidæ)	Sugar cane	„ „
Sturmia atropivora, R. D. (Dip. Tachinidæ)	Acherontia atropos, L. ...	„ „
Orthellia nigrocincta, Big. (Dip. Muscidæ)	.....	„ „
Dacus ciliatus, Lw. (Dip. Trypetidæ)	Cucurbits	H. K. Munro.
Amplicœcum sp. ? (Worm Ascaridæ)	Echinopstelfairi (Madagascar)	Dr. Baylis.
Physaloptera dispar, Linstow. ...	„ „	„

Education.

Courses of lectures in Zoology and Entomology were delivered by the Assistant Entomologist to the first and second year students of the College of Agriculture.

The Scientific Assistant acted as Examiner in Zoology and Entomology for the Registration of Agricultural Chemists and for the Monitors and Teachers' Examination in Nature Study.

Publications.

The following publications have been prepared during the year and will be issued shortly :—

(*a*) "Insect pests of vegetable, garden and ornamental plants in Mauritius."

(*b*) "Coleoptera of economic importance of Mauritius."

(*c*) "Sugar Cane Borers."

(*d*) "Report on Madagascar mission."

A. MOUTIA,
Assistant Entomologist.

VI

CHEMICAL DIVISION

Investigational work—(a) Illicit rum.

The main line of research during the year under review was the investigation concerning illicitly produced local rums. One hundred and thirty five samples of "legal" and "illicit" rums were analysed in this connection. It has generally been considered that "legal" and "illicit" rums cannot be differentiated as the two products overlap with regard to chemical composition, strength and flavour. The crux of the problem lay in the variability of these rums and it was anticipated that illegal manufacture could be detected by the occurrence of certain substances whose presence was due to the crude method of distillation practised by illicit distillers. With this object in view the determinations carried out were specially directed to the character of the "distillate" in respect of the proportion of secondary constituents:

(i) a. Volatile acids
   b. Fixed acids
(ii) Esters
(iii) Higher alcohols
(iv) Aldehydes other than furfuraldehyde
(v) Furfuraldehyde

The results of the research were satisfactory and an exhaustive report was finally submitted to the Officer Administering the Government through the committee duly appointed to report on the "Control of Illicit Distillations".

(*b*) *Camphor.*

The final report in connection with the camphor distillation test was submitted, and the informations derived from this investigation may be summarised as follows:

(i) Crystalline camphor can be produced under Mauritius conditions,

(ii) The camphor oils produced were of a very pale yellow with a fine smell reminiscent of citriodora, the odour of camphor was, however, also perceptible.

(iii) No difference in yield was observed when the samples composed of leaves and twigs were distilled fresh or dry.

(iv) The physical constants of a mixed sample of camphor oils were:—

Specific Gravity at 20°C.	... 0.8831
Refractive Index at 20°C.	... 1.4669
Specific Rotation	... +14°34′

The typical camphor oils from local oil-yielding trees have always shown a claevo-rotatory deviation.

(c) *Analysis of Milk from the Government Dairy, Curepipe.*

The analysis of samples of milk was carried out during two weeks in the month of May. These samples were taken in the morning and in the evening under the supervision of the Assistant Chemist, only butter fat and solids not fat being determined. The average figures are given below, from which it can be seen that the butter fat content is quite satisfactory.

	Fat	Solids not fat
Morning milk ...	3.00%	8.63%
Afternoon milk ...	4.30%	8.78%

As expected the evening milk is much richer than the morning milk both in butter fat and in solids not fat.

(d) *Infertility of subsoils.*

Experiments are in progress to ascertain if it is possible to solve the problem of the infertility of subsoils in Mauritius.

Samples of soils were secured from Le Val Sugar Estate. The samples were taken from representative portions of the infertile area at a depth of 9, 18, and 30 inches respectively.

Analytical figures are given below; Winogradski's "Plaque Moulee" method of determining the nutrient requirement of soils was also tried and results obtained therefrom were very promising.

	A (9")	B (18")	C (30")	A' (9")	B" (18")	C" (30")
Moisture ...	9.81	9.16	9.06	8.04	8.65	9.55
Insoluble silica ...	18.10	18.50	22.70	16.70	19.60	24.00
Acidity (pH) ...	5.8	6.0	6.3	5.7	6.0	6.2
Sol. Fe_2O_3 ...	0.065	0.010	Traces	0.035	Traces	Traces
Phosphoric acid (total) ...	0.17	0.10	0.12	0.13	0.10	0.11
Phosphoric acid (available) ... (citric method) ..	Practically Nil	Nil	Nil	Practically Nil	Nil	Nil
Phosphoric acid available ... (Truog method)...	Practically Nil	Nil	Nil	Practically Nil	Nil	Nil

Work done for other Government Departments.

(a) Samples of coal were analysed for the Railway Department, the calorific value as well as the percentage of ash and the sulphur content being determined.

(b) Samples of lubricating oil were also received from the same Department, the specific gravity at 60°F. was found to vary from 0.9283 to 0.9497 and the flash point from 220°F. to 450°F. The viscosity was determined at 140°F., 200°F. and 250°F. respectively.

Routine Analysis.

The routine work of the Chemical Division showed an increase during the year under review as compared with the preceding year, due to the fact that the number of samples of cane juice has very materially increased; pressure of work in other directions as well as the absence of the Senior Assistant necessitated the employment of the services of junior officers from other Divisions.

The following samples were received and examined :—

	Samples received	Estimations
Guano melange ...	9	44
Lime ...	3	3
Dipping	17	20
Phosphatic manures ...	3	3
Fumier	8	21
Feeding stuff ...	3	19
Miscellaneous ...	14	23
Cane juices C. E. S. ...	400	800
„ S. R. S. ...	660	1,320
	1,117	2,253

In addition to the above and in connection with investigational work, the following determinations were performed :—

	No. of samples	Estimations
Rum	135	740
Soils	11	75
Milk	102	306
Coal	2	6
Lubricating oil ...	7	49
	257	1,176

Education.

The usual duties in relation to teaching at the Mauritius Agricultural College were performed by the Assistant Chemist and the Senior Scientific Assistant. These duties consisted of the delivery of three lectures and the supervision of two laboratory periods weekly.

Since the departure of Mr. Berchon on leave, the Assistant Chemist has been in charge of all the lectures in Chemistry.

The Assistant Chemist was appointed one of the four examiners for the examination for the Registration of Agricultural Chemists.

Miscellaneous.

The Assistant Chemist acted as one of the four members of the Illicit Distillation Committee appointed by H. E. the Governor to report on questions ref. control of illicit distillation.

R. LINCOLN,
Assistant Chemist.

VII

TOBACCO DIVISION

General Conditions.

The cyclone which occurred on the 10th April and the heavy rains which succeeded it caused considerable damage to unharvested tobacco and also to seed beds. The heavy rains which persisted during April and May in the districts of Flacq, Rivière du Rempart and Pamplemousses also caused extensive damage to plantations and seed beds, so much so that all available seed was utilized in resowing and several planters were compelled to curtail their proposed acreage. The rainfall returns for the Tobacco Station, La Ferme, are appended.

Fertilizer Experiments.

On the opening of the Tobacco Station at La Ferme a definite series of manurial experiments were laid down but unfortunately the first of these series, which were planted in field 3 during December 1931, were completely destroyed by the cyclone of April 1932 and final results were thus unobtainable. A further series, planted in field 2 during May, were carried to a successful conclusion and much valuable information obtained; these were repeated in field 1 during September but results from these experiments are not available yet.

The object of these experiments is the testing of various fertilizer mixtures under the existing conditions at La Ferme and the experiments were divided into three series i.e. Nitrogen, Phosphate and Potash series.

It was hoped to be able to carry out a three-crop rotation of tobacco, green manure and maize, but, owing to only three fields being available and the growing of two crops of tobacco per year, it was found impracticable owing to there being insufficient time available to obtain a good covering of green manure to be dug in to increase the already deficient humus content of the soil. A two crop rotation has therefore been carried out i. e. Tobacco, Green Manure. Under the present rotation system each field bears alternately a summer and winter crop of tobacco which is highly desirable in view of the fact that Black Shank disease (*Phytophthora sp*) causes no damage during the winter crop and is thus controlled to a very large extent by this system of rotation.

The Tobacco Station, La Ferme, is situated in the Black River district which comprises the north west coastal area. The Station is seven miles from Port Louis on the main Black River road. The mean altitude of the Station is approximately 430 feet above sea level. The soil is of the red loam type and contains a high percentage of silt, an analysis of which, performed by the Sugarcane Research Station, is appended. The climate generally of the district is warm and dry and the rainfall is chiefly confined to the summer months. The tobacco crop is grown principally under irrigation from the water supplied by the La Ferme irrigation scheme. During the winter months the rotation crop of green manure has also to be grown under irrigation. The follow-

ing tables give the results of a chemical analysis of the soil at this Station and the rainfall during 1932 which was unusually generous.

Chemical analysis of soil from La Ferme Tobacco Station.

pH	6.75
Lime requirements ($CaCo_3$ in tons per acre) ...	... 2.7
Organic Nitrogen	... 0.28
Organic Matter	... 3.9
P_2O_5 sol. in Strong HCl ...	... 0.18
P_2O_5 sol. in 1% Citric Acid ...	... 0.0010
K_2O sol. in Strong HCl ...	... 0.037

Rainfall record for La Ferme Tobacco Station during 1932.

	mm.
January	52.4
February	221.39
March	233....
April	143.4
May	181.1
June	82.5
July	3.8
August	11.5
September...	7.7
October	16.5
November	...
December	13.1
	966.39

Plot Technique.

The experiments were conducted with four replicates of each treatment, each plot is 1/40th of an acre in size and the plots were randomized, a space of six feet being left between the plots to prevent overlapping; this space is occupied by stone walls constructed from the stones and boulders cleared from the land. Selected plants of the variety Amarello were transplanted in rows 3'x3', the plots of each treatment being planted on the same day and all vacancies replanted on the seventh day. The fertilizers were mixed and the correct quantity for each plant applied to the position the plant would occupy in the field two weeks before transplanting. In harvesting, the tobacco from each treatment was kept separate and labelled. It was not found possible, owing to shortage of supervision, to keep tobacco from each plot separate. The grade index is calculated on the average value of the leaf obtained from each treatment.

Field Notes.

During the growing season every endeavour was made to obtain information regarding the effects which the different treatments had on the growth of the plants and measurements of the height of the plants

and counts of the number of leaves formed were made at stated periods and these are set out later in tabulated form. Owing to pressure of other work it was not found possible to take into consideration the size of leaf together with other points such as spacing of leaves, etc.

Nitrogen Series

The nitrogen experiments consisted of five treatments in which the following applications of phosphates and potash were constant i.e. 300 lb Superphosphate and 125 lb Potash per acre. There were four replicates of each treatment. Outstanding effects were noticed in the yearly growth of the plants, and, as was to be expected, N1 made exceedingly slow growth indeed. Nitrate of Soda appeared to have a retarding effect on early growth, whereas Sulphate of Ammonia hastened growth considerably. All plots were planted on the 2nd May.

TABLE 1

GROWTH TABLE

Treatment	One month after planting		One month after planting		One month after planting		Harvesting	
	Average height inches	Average number of leaves	Average height inches	Average number of leaves	Average height inches	Average number of leaves	Commenced	Completed
							July	October
N 1 ...	3.7	6	14.5	10	21	12	11	26
N 2 ...	5.7	8	14	14	25	16	4	13
N 3 ...	4.9	7	16.25	16	24	18	4	13
N 4 ...	4.9	6	11.5	15	20	16	11	26
N 5 ...	4.6	7	10	14	21	17	11	26

TABLE 2

The final computed yields are as follows:—

Treatment	Source of Nitrogen	Yield per acre	Grade Index
		Kilos	
N 1 ...	No Nitrogen	420	81.5
N 2 ...	Sulphate of Ammonia 150 lb. ...	626	94.6
N 3 ...	Sulphate of Ammonia 300 lb. ...	796	86.5
N 4 ...	Nitrate of Soda 200 lb. ...	526	78.25
N 5 ...	Nitrate of Soda 400 lb. ...	451	79.5

An examination of the tables Nos. 1 and 2 clearly indicates the superiority of the treatments containing Sulphate of Ammonia both as regards yield and earliness of the crop. Nitrate of Soda shows but

little superiority over the treatment with no nitrogen, and it will also be noticed that the heavier dressing of nitrate of soda appears to have had a depressing effect on the yield.

Phosphate Series.

This series consists of five treatments in which the following applications of nitrogen and potash remained constant i.e. Sulphate of Ammonia 200 lb., Sulphate of Potash 150 lb. Outstanding effects were noticed in all the treatments. The treatment P 1, which contained no phosphates, being extremely poor and slow in growth, the plots receiving superphosphate showed a marked superiority in growth during the first month or so as will be seen from the following growth table. All the plots were planted on the 7th May.

TABLE 3

Treatment	One month after planting		Two months after planting		Three months after planting		Harvesting	
	Average height inches	Average number of leaves	Average height inches	Average number of leaves	Average height inches	Average number of leaves	Commenced	Completed
							July	October
P 1 ...	2.7	4	5.5	11	9	13	21	26
P 2 ...	3.5	5	11.5	14	22	16	11	13
P 3 ...	4.3	6	16	14	25	16	11	13
P 4 .	3	4	11	13	15	16	18	26
P 5 ...	3	4	7	14	14	15	18	26

The final computed yields are as follows :—

TABLE 4

Treatment	Amount of Phosphate applied per acre	Yield per acre	Grade Index
		Kilos	
P 1 ...	No Phosphate ...	265	88.4
P 2 ...	Super Phosphate 225 lb ...	437	106.7
P 3 ...	Super Phosphate 450 lb ...	475	115
P 4 ...	Guano Phosphate 150 lb ...	360	48.8
P 5 ...	Guano Phosphate 300 lb ...	275	63.6

An examination of the tables 3 and 4 clearly indicates a marked superiority of superphosphate over guano phosphate. The growth of the plants was considerably hastened and was more even. The leaf obtained from the plots without phosphates was distinctly inclined to be papery and lacked body.

Potash Series.

This series consists of three treatments in which the following applications of nitrogen and phosphates remained constant i.e. Sulphate of Ammonia 275 lb, Superphosphate 300 lb. Very little difference was noticeable in the growth of the plots; the application of potash would appear to have but little effect as will be seen from the following growth table. All the plots were planted on the 23rd May.

TABLE 5

Treatment	1 month after planting		2 months after planting		3 months after planting		Harvesting	
	Average height inches	Average number of leaves	Average height inches	Average number of leaves	Average height inches	Average number of leaves	Commenced	Completed
							July	October
K 1 ...	5	6	15	15	27	18	30	26
K 2 ...	4.4	6	14	15	31	17	30	26
K 3 ...	5.5	6	15	15	31	17	30	26

The final computed yields are as follows :—

TABLE 6

Treatment	Amount of potash applied per acre	Yield per acre	Grade Index
		Kilos	
K 1 ...	No Potash	300	107.6
K 2 ...	Sulphate of Potash 150 lb ...	307	125.5
K 3 ..	Sulphate of Potash 200 lb ...	310	100.6

An examination of the tables Nos. 5 and 6 indicates that the application of potash has but little effect on the growth or yield in so far as weight is concerned.

To sum up the results so far obtained from these manurial experiments it would appear that in the nitrogen series sulphate of ammonia has a distinct advantage over nitrate of soda, increasing both yield and quantity of leaf and also hastening the maturity of the plant. It is also obvious that nitrogenous fertilizers are necessary to obtain maximum yields. In the potash series, superphosphate shows a decided advantage over guano phosphate both in yield and quantity and also in hastening the maturity of the crop.

It is also clearly demonstrated that phosphates are a more essential factor for obtaining maximum yields.

In the potash series the greatest difference exists in the grade index K2 showing a decided superiority over the other treatments. As, however, the grade index depends in no small measure on the curing of the leaf the probable error is considerably increased and therefore it is impossible to say with any certainty that K 2 is superior to K1. It will be of great interest to note whether future experiments produce results of a like nature. When the experiments have been conducted over a series of crops it will be possible to draw definite conclusions. During the coming year it is proposed to carry a series of manurial experiments on various estates throughout the Island, under different soil and climate conditions. The experiments will be more extensive than those at present carried out at the Tobacco Station where the extent of the experimental work is governed by the land available.

Variety trials.

Trials were conducted with the following varieties :—Big Orinoco, Warne, Gold Leaf, Yellow Pryor, Hickory Pryor and Hester but none of these showed any promise whatsoever. The standard fertiliser treatment used included phosphates applied as guano phosphate and whether the poor results obtained were in a great measure due to this factor is impossible to say. In view of the fact that phosphates in the form of guano appeared to have a retarding effect in the manurial experiments, further trials are to be conducted in which phosphates will be applied in the shape of superphosphate.

Burley trials.

Lack of seed and poor germination led to a curtailment of these trials, only sufficient plants being obtained for seed purposes. A further series of trials will be conducted but at present this type does not appear suitable for conditions as existing at La Ferme.

Seed selection.

During the year 1931 seed was saved from specially selected plants the seed from each plant being kept separate. This seed was sown during March and 14 plots were planted for further selection. The object of the selection work is an endeavour to obtain an improved strain of Amarello and at the same time obtain a strain true to type. The variety Amarello, as commonly met with, consists of plants with marked difference in characteristics such as :—shape of leaf, position of leaf on stem, texture, appearance of leaf, etc. In the majority of plantations the differences in the various plants are most striking, plants being seen with drooping leaves, crinkly leaves and smooth leaves. It has also been noticed that certain types of leaves cure better than other types. Selection is being guided by the various factors which build up the quality of the leaf. The progeny from the first selected plants has been carefully re-selected and each selected plant given a number, and as the plants arrived at maturity a further selection was done, all unsuitable plants being discarded. The first generation has given very promising results and it is hoped that in a short time a more dependable strain will be obtained.

In view of the shortage of seed at the commencement of the year an extra area of approximately one acre was planted for the sole purpose of obtaining seed for distribution to planters. To enable this to be done Mr. Hugnin of Anna Estate kindly gave permission for the re-opening of the land at Monna and this area will be cultivated in a three crop rotation; by these means it is hoped to preserve a constant supply of reliable seed for distribution to planters.

Legislation.

The following Ordinances came into force or were passed during the year under review :—

Ordinance 38 of 1930 (The Tobacco Production and Marketing Ordinance) came into force on the 2nd February 1932.

Ordinance 46 of 1931 (The Tobacco Production and Marketing (Amendment) Ordinance 1931) came into force on the 2nd February 1932.

Ordinance 27 of 1932 (The Tobacco and Marketing (Amendment) Ordinance 1932).

Under the above Ordinances the Government Tobacco Warehouse was opened and the control of the production and sale of leaf tobacco vested in the Government Tobacco Board.

Thus all the itinerary work and Warehouse came under the direct control of the Government Tobacco Board and will therefore be dealt with fully in the annual report of the Warehouse. The activities of the Tobacco Division were therefore confined to the experimental work.

Production.

The effect that the development of the local Tobacco Industry has had upon the imports is clearly illustrated in the annexed graph in the Appendix. In the year 1925 the value of the tobacco imports was Rs. 2,077,354 whereas in the year 1931 the value was Rs. 287,745. There is no need to dwell on the value of the industry to the Colony, as such figures form a conclusive proof thereof; the effect of such a reduction in imports alone can be measured, especially at a time when there was a substantial adverse trade balance.

The amount of leaf sold by planters during the year 1932 was Ks. 254,936.5 as against Ks. 409,557.1 in the preceding year; the amount of local leaf used in manufacture was Ks. 255,477.4.

The weather conditions experienced in the early part of the year had the effect of curtailing the production of leaf but at the end of the year there was evidence that the small Indian growers were extending their plantations. The opening of the Warehouse had the effect of depressing to some extent the production of tobacco amongst the small growers who produce air-cured leaf but increased confidence was noticeable towards the end of the year.

The opening of the Warehouse was responsible for an increase amongst the large planters, particularly in the Black River District, and more than 50% of the leaf produced was flue cured.

The area registered under cultivation during the year was 1,295¾ acres as against 1,771 acres in the year 1931. The distribution of the acreage was as follows:—

District	1931	1932
Flacq	640 acres	215⅞ acres
Rivière du Rempart	489 „	195½ „
Pamplemousses	331 „	266⅜ „
Port Louis	18 „	4¼ „
Black River	197 „	530 „
Plaines Wilhems	73 „	66 „
Moka	18 „	10½ „
Grand Port	4 „	6 „
Savanne	1 „	1¼ „
	1,771 „	1,295¾ „

Miscellaneous.

On the 23rd July a demonstration was held at the Tobacco Station which was attended by a large number of planters. The experiments in progress were fully explained by the Government Tobacco Officer and also hints given on the preparation of seed beds. The Botanist and Mycologist who was in attendance gave hints on the detection and cause of certain diseases and the methods to be adopted to prevent their spread. It is hoped that this will be a forerunner of many such demonstrations.

The opening of the Government Tobacco Warehouse and vesting of the control of production and sale of leaf in the Government Tobacco Board relieved the Tobacco Division from certain expenditures which had previously been paid out of the estimates for Minor Industries; the costs of the Tobacco Division were thus considerably reduced. In addition to this direct reduction of expenditures the Government Tobacco Board refunded to Government 75% of the Government Tobacco Officer's salary as from 2nd February.

All the buildings at the Tobacco Station have been kept in a state of repair and a grading and bulking shed was built. The buildings, however, leave much to be desired and are not comparable to the buildings found on a tobacco estate.

G. CORBETT,
Government Tobacco Officer.

VIII

GOVERNMENT DAIRY

Yield of Milk.

123,313 litres of milk were produced during the year, showing an increase of 3,390 litres on the previous year. The milk was disposed of as follows:—

Supplied to Government Hospitals:	75,001 litres
„ the public:	39,421 „
Fed to calves:	8,452 „
Samples for control:	439 „

The milk was sold at 25 cents per litre until the 30th June and thereafter at 22 cents per litre.

Births.

49 births were recorded viz : 24 females and 25 males including one male and one female born twins.

Deaths.

Two cows, one aged and one young, died from antepartum paralysis, one aged cow from impaction, and another from septicaemia following retention of afterbirth.

Abortion.

Twelve cases of abortion were recorded as against 21 last year. Of these 12 cases, six occurred during the month of December. 25 cows retained their afterbirth.

Sales.

34 calves were sold to breeders. Nine cows were sold to the butcher on account of old age.

General remarks.

The principle adopted previously of supplying more milk to Hospitals and only a limited quantity to members of the public, was reversed as from July 1st. Intensive propaganda was carried out to ventilate the new decision and as a result the number of customers of the Dairy was more than doubled, the amount of milk sold to the public passing from 2,364 litres for the month of June to 5,540 litres for December. A graph is exhibited in the Appendix which illustrates the yearly output of milk at the Dairy.

Y. LEFEBURE,
Officer in Charge.

IX

STATISTICAL DIVISION

Agricultural Statistics.

The Blue Book section relative to Agriculture was prepared. Statistical data from estates, bearing on crops, cattle, machinery, manufacture, etc. were collected and tabulated. Statistical information was supplied to the International Institute of Agriculture, Rome, to the Board of Trade, the Colonial Secretary's Office, the Immigration Department etc. and to various interested bodies, both here and abroad.

Quarterly reviews on the Cost of Living, on Weather and Crop conditions, were supplied to Government and the usual forecasts of crop production prepared.

The results of field experiments conducted by the Department in relation to variety and manure tests were subjected to the usual statistical analysis.

Agricultural Meteorology.

Observations of air temperature, humidity, rainfall and autographic records of temperature, sunshine, wind direction and velocity were obtained at the Central Experiment Station, Réduit. Maximum and minimum temperature, temperature of evaporation and rainfall were recorded at Curepipe Botanical Garden, Abercrombie Nursery and Barkly Experiment Station. Rainfall observations were taken at the Royal Botanical Gardens, Pamplemousses. In addition, most sugar estates contributed rainfall observations. These data are reduced, tabulated and co-ordinated by the Statistician for use in crop forecasting and for agricultural questions connected with climatic factors. Summaries of meteorological results are published in the Appendix of the present report.

Educational.

The general management of the Agricultural College was carried on the same lines as heretofore, under the direction of the Principal and with the help of the College Clerk. Lectures and practical work in Physics and applied Mathematics were delivered twice a week to first year and second year students and once a week to third year students of the Agricultural College.

Special Work.

Work continued, sporadically, on the Population Census of Mauritius and Dependencies.

A mathematical method for computing the probable sugar crop, based on rainfall and temperature, was evolved during the year. Extensive rainfall data were collated with a view to drawing up an up to date rainfall map of the Island.

M. KOENIG,
Statistician.

X

CO-OPERATIVE CREDIT SOCIETIES

Administration.

Mr. G. E. Bodkin, B. A., Dip. Agric., (Cantab), was appointed Director of Agriculture and Registrar Co-operative Credit Societies and arrived in the Colony on March 3rd. Between the 1st January and Mr. Bodkin's arrival, Mr. A Glendon Hill, B.A., B. Agr. (Dublin), A.R.C.Sc., (Ireland), Senior Geneticist, Sugarcane Research Station, acted as Registrar of Co-operative Credit Societies.

The personnel of the administration of the Societies which, up till September, consisted of a Registrar, an Assistant Registrar and an Inspector, was strengthened by the appointment of two additional Inspectors, viz:—the Assistant Agricultural Officer and an Assistant Agricultural Instructor. Both these officers have, since their appointment as additional inspectors, been performing the inspection duties of some of the societies in addition to their original duties. Eight societies have been allotted to one officer and six to the other, the regular

inspection duties of the remaining societies devolving upon the whole-time Inspector, in addition to which he made occasional inspections of the societies allotted to the additional inspectors and performed the clerical duties relating to the working of the societies.

Sources of Capital.

The total working Capital of these societies is derived from the following five sources :—

(1). Share Capital :—

A shares of Rs. 10 each ; originally contributed by the shareholders ; and are dividend producing ones.

B shares being dividends not drawn by the shareholders and which have contributed towards the formation of the shares of this class. Dividends are not paid thereon.

(2). Deposits of Non-Members.

(3). Deposits of Members.

(4). Government Loans.

(5). Reserve Fund.

No advance from State funds was made to the societies during the year, and advances totalling Rs. 2,080 were repaid to Government by the societies. The total amount of advances still due to Government by the societies on 31st December was Rs. 2,540 ; and is exclusive of the balances of Rs. 450 and Rs. 600, still due by the dissolved societies of Bara-Mian and Vieux Grand Port respectively.

The total Reserve Fund of the societies which now stands at Rs. 212,121 is approximately three times the value of the shares originally contributed by the members.

Dividend and Interest.

Exclusive of the Trefles Co-operative Credit Society (Rodrigues) the total number of societies in operation in the Island on 31st December was 28. None of the societies declared dividends. The rates of interest on loans to members now charged by the Societies ranged from 6% to 12% viz :—

5	societies charge	6	% interest	on loans to their members.
3	"	7	"	" "
12	"	8	"	" "
2	"	9	"	" "
4	"	10	"	" "
2	"	12	"	" "

Dissolved Societies.

The number of dissolved societies was nine, but in view of the financial depression now prevailing, it has not been possible to close liquidation proceedings in the case of any of them.

Loans to Members and Recoveries.

Loans to members are issued on personal securities. In exceptional cases, however, they are also issued on mortgage securities. The total of the loans issued during the year was much less than that issued the year previous. This decrease was mainly due to the damage caused by

the last cyclone and the grave decline in the price of sugar. These facts affected recoveries and fresh loans could not be issued. Besides these two adverse factors the extreme tightness of the local money market imposed a very severe strain on these small agriculturists. Loans were issued chiefly for cane cultivation and in a few cases for vegetables and other food crops.

Nevertheless, there are a few societies which continue to work well and some of these have built up substantial Reserve Funds and are independent of borrowed Capital. With regard to the others it is proposed to effect a very thorough overhaul of their affairs in an attempt to bring about some improvement in their economic position and it is hoped that, with the gradual return of normal conditions, societies may settle down to a steady career of usefulness.

Annual General Meetings.

The Annual General Meetings of the Societies were held during the month of July and on the 3rd of August 1932; they were attended in 21 cases by the Registrar, the Assistant Registrar and the Inspector; and in the case of seven societies by the Registrar and the same Inspector.

At these meetings the books of these societies were examined and the transcript of overdue loans and other statements of accounts prepared by the Inspector on the occasion of his Audit Inspection in June, checked. To the usual letters sent to the President of each society, in which the affairs of the society are briefly reviewed and advice given, were also appended copies of the Balance Sheet, Profit and Loss Account and a statement of Receipts and Disbursements.

Amendment of Co-operative Ordinance.

The question of amending certain sections of the main Ordinance governing the working of the societies (referred to in the usual, special annual report on the working of these societies last year) has not yet been settled. But, following the Secretary of State's particular point mentioned in his Despatch No 44 of the 2nd February 1932 to the effect that, in Mauritius, the existing system and the rules under which Co-operative Societies operate are no longer wholly in accord with the best current practice, it is proposed to undertake as early as possible a close examination thereof with a view to general revision.

It is hoped that the inauguration of a much closer system of inspection and advice embodying a great degree of personal contact with the members of these organisations, coupled with the proposed changes in the Ordinance to which reference is made above, as well as a return to times of more even finance, will, in no small degree, serve to ameliorate existing conditions.

The work of these societies forms the subject of a special annual report issued in August. The details of the working thereof for the financial year ended 30th June, 1932 are shown in the annexures to such Report.

M. BURRENCHOBAY,
Inspector of Co-operative Credit Societies.

XI.

RODRIGUES.

CLIMATIC CONDITIONS 1932.—*Rainfall.*

	Oyster Bay		Solitude		La Ferme	
	Inches	Rainy days	Inches	Rainy days	Inches	Rainy days
January ...	.73	10	.91	10	3.73	3
February ...	6.51	16	6 80	12	4.70	8
March ...	7.74	15	8.87	15	8.71	13
April ...	9.58	22	8.18	18	6.59	12
May ...	5.21	13	6.09	9	4.82	5
June ...	2.94	12	2.03	9	1.77	7
July ...	2.94	17	3.44	9	2.02	6
August ...	2.38	21	2.80	...	2.83	7
September ...	1.51	16	1.06	...	1.28	4
October ...	3.54	15	2.96	...	3.29	6
November ...	.45	4	.44	...	.44	2
December ...	.76	6	.71	...	.22	2
	44.29	167	45.29		40.40	75

Highest rainfall in one day.

Oyster Bay—On the 1st of May : 3.63 inches
Solitude — „ 3.58 „
La Ferme — „ 3.58 „

General Conditions.

The year 1932 was at the outset extremely unfavourable for agriculture. From October 1931 a lack of rainfall was experienced and at the begining of 1932 the Island was suffering from a severe drought, a shortage of food crops was thus brought about from January to May. During that period the Government gave assistance to the population, prohibition of net fishing was suspended and men were employed on relief work. A Food Committee was established to control sale prices of certain articles of food.

The drought was brought to an end on the 13th of February by a cyclone passing close to the Island. The rainfall thus obtained allowed farmers to start new plantations From then to the end of the year the weather conditions, upon the whole, were favourable for agricultural operations, although the thunderstorm occurring during the night of the 30th April damaged some plantations made on slopes of hills. The rainfall occurring in October proved of great benefit to the standing plantations and was the cause of good yields being obtained from the crops in November and December.

Maize.

A shortage of sowing material was experienced when plantations were started in February as seeds had been damaged by weevils. Seeds to be issued to planters were imported from Mauritius through the Agricultural Department.

The plantations thrived well and a fair yield was obtained. The export of maize during the year reached 2,690 bags ; this quantity is the highest exported during the last 10 years. In certain localities, farmers were able to raise three crops of maize.

Sweet Potatœs.

Cuttings for replanting were only available at the end of March. Plantations prospered and from July on this foodstuff was abundant.

Manioc.

There has been some extension in the cultivation of this crop. However this foodstuff is not yet cultivated on the same area as it was in 1926 when the "Die-back" disease destroyed most of the plantations. This disease is still affecting the plantations, chiefly those exposed to the wind. Good yields were obtained from those fields free from the disease.

Yams.

This crop did not yield very well. The plantations suffered heavily from the prolonged drought. This foodstuff had been planted in October 1931.

Beans.

The area planted was about the same as in 1930 and 1931. Although several plantations were made late in the season the yield was satisfactory. The quantity exported is the highest for the last ten years.

Peas.

This vegetable is not cultivated on a very lare scale. Fair yields were obtained.

Garlic.

This crop gave satisfactory yields.

Onions.

Yields have been quite good.

Bambarra Nuts (*Voandzeia madagascariensis*).

The farmers who have grown this foodstuff were very satisfied with the results obtained.

Eddoes and Tannias.

The farmers, having suffered from a shortage of foodcrops, have taken this year a marked interest in the growing of this drought resisting variety of food plant.

Rice.

The plantations were established very late in the season and failed.

Tobacco.

A fair yield of dried leaves was obtained in April and May. The prices offered by the Tobacco Board did not, however, satisfy the growers. Only two bales of tobacco have been exported. The holders

of cured leaves have kept their stock; some of them selling by small quantities for local consumption. The planters have fortunately understood the necessity of growing a better type of tobacco and they have started on a small scale plantations of new varieties. (Seeds imported from Mauritius). These plantations were established for the purpose of obtaining seeds for next planting season. Remunerative prices are offered by the Tobacco Board for the above varieties.

Fruit Trees.

The season has been favourable for the growth of fruit trees. Mangoes and Citrus were abundant. Some Litchi plants have fruited for the first time. Bread fruit trees are progressing.

Acacia (Leucaena).

There has been a fair demand for acacia seeds. The export, which had fallen in 1931 to 3,582 bags, has reached this year the normal figure of 8,181 bags.

Livestock.

Increased interest has been manifested in the improvement of breeds of livestock. A fair number of crossbred Sindhi cattle are to be found in the different herds. Considerable improvement is being effected in the breeds of sheep and pigs. Another direction in which progress is noticeable is in the breeding of poultry. Fine specimen of crossbreds Rhode Island Red are now being met with in different localities.

Animal Diseases.

No disease of economic importance has occurred during the year. In November several deaths of cattle occurred in the herd of one breeder. Information was obtained too late to allow of an investigation being made as to the cause of death. Tuberculin tests were carried out on two bulls and two cows. None of them re-acted to the test The herd is being kept under observation and visited frequently.

Disease of Beans.

Mosaic disease was prevalent in some localities. Advice was given to planters as to the best method of controlling the spreading of the disease and also the great necessity of selecting from very healthy plants seeds to be kept for replanting.

Buildings, Roads etc.

Repairs were made to the buildings of the experimental Station and Stock Farm as some of them had been damaged by the cyclone of the 13th of February. The quarters of the Agricultural Superintendent required repairs. These have been partly done. The building of new pig sties has been completed.

A new water reservoir was built near the pig's run to replace the old one which was unserviceable. The effects of a flood occurring on the 1st of May have greatly impaired for a time the general aspect of the station. The bridge was broken and the drains plots and fences were damaged. The plots were restored and the necessary repairs have been made.

Water Supply.

A new wall has been built in front of the one existing at the dam issuing water to the Experimental Station and Stock Farm and a new water reservoir 28 x 12 ft was erected with a view to supplying water to the inhabitants of Oyster Bay and Acacia. These were roofed according to the recommendations of the Honourable Director of Public Health and of the Honourable Director of Public Works.

Examination of Plants.

Consignments of plants, tubers and fruits were regularly examined by the Agricultural Superintendent. Two crates containing grape fruits imported from Batavia were seized and destroyed. The fruits showing traces of a severe attack by insects.

Introduction of Cochineal Insects.

The cochineal insects imported from Mauritius in 1931 with a view to destroy the Prickly Pear (Opuntia sp) have been liberated in different localities These insects can now be found only in one of these localities.

Agricultural Instruction.

Special attention was devoted to the improvement of the method of cultivation employed in Rodrigues. Constant visits were paid to the holdings of planters and advice given as to the great necessity of having the fields manured.

Satisfactory progress is being recorded in the methods employed by the farmers of La Ferme and its surroundings. Manure is being applied to the fields and drains and walls built to avoid soil erosion. In the other localities the progress made is slow.

School Gardens.

Authorization was obtained for the creation of school gardens at La Ferme, Brule and St. Gabriel.

La Ferme.

The garden was created in March. Simple experiments with food crops have been carried out and gave satisfactory results. Every fortnight lectures were delivered by the Agricultural Superintendent and practical work was carried out in his presence. The theoretical knowledge of the pupils is fair.

St. Gabriel.

The class was held by the Head Teacher. Very little work could be done as the attendances were very poor. The amalgamation of this school with the one of Brulé has been decided on. The latter is being transferred to Lataniers. A new garden will be created there.

Demonstration Plots.

Authorization for the creation of demonstration plots has been obtained in August. Considerable time was devoted to explaining to the farmers the usefulness of these plots and to persuade them to take special interest in the scheme by attending regularly the monthly meetings. A real success has been met with at La Ferme and its surroundings. The demonstration plot has been started and will, at the beginning especially, be devoted to the cultivation of tobacco. (Varietal and manurial experiments to be carried out).

In the other localities, owing to the indifference of a great number of the inhabitants, the result was somewhat disappointing. The site for the establishment of the demonstration plot has been selected at St. Gabriel and it is hoped that as soon as the work is in progress a greater interest will be manifested by the farmers.

Land Tenure.

During the year 111 leases were entered into as follows:—

76 Agricultural acres
9 Acres (tree leases)
19 Cattle posts
5 Fishing posts
2 Shop sites
8 Residences
1 Town lot

In nearly every case the land applied for has been visited by the Agricultural Superintendent before the granting of the lease. A census of Crown lands leased and of private properties has been made.

Exports.

Acacia seeds (Leucæna)	8,181 bags
Beans	1,107 „
Maize	2,690 „
Peas	27 „
Garlic	381 „
Onion	11 „
Tobacco	2 bales
Salt Fish	4,751 „
Cuttle Fish	933 „
Hides	1 „
Salted lemons	22 casks and 3 cases
Shells (mother of pearl)	7 bags and 1 drum
Trepang	12 bags
Bees wax	2 cases
Pumpkins	7 bags
Gum	11 „
Manure	3,530 „
Timber	30 bundles
Bones	52 bags
Cattle	311
Donkey	1
Pigs	2,212
Sheep	770
Goats	2,515
Dogs	26

Trefles Co-Operative Credit Society.

The Co-operative Credit Society has continued to work during the year. The repayments of loans have been rather slow. No applications for new membership were received. With the creation of the

demonstration plots, coupled with the regular delivery of lectures on agriculture, it is hoped to widen the range of the Society. Five loans amounting to Rs 255 have been granted.

Rs. 26.51 cs (instalments and interests) were paid to the Rodrigues Treasury. (Refund of Government loan).

Rs. 70 for loans refunded and Rs. 19.53 cs interest have been paid in.

Cash in bank and in hand up to 31.12.31	...	Rs. 222.82
Receipts	...	89.53
		Rs. 312.35

Loans issued	...	Rs. 255.00
Refund to Government	...	26.51
Cash in bank and in hand	...	30.84
		Rs. 312.35

RENÉ JAUFFRET,
Agricultural Superintendent.

PART III

MISCELLANEOUS

Legislation.

The following Ordinances, Proclamations and Notifications were issued during the year :—

Proclamation No. 1 of 1932.—To declare that the Tobacco Production and Marketing Ordinance 1930 shall come into force on the second day of February, 1932.

Proclamation No. 2 of 1932.—To declare that the Tobacco Production and Marketing (Amendment) Ordinance 1931 shall come into force on the second day of February, 1932.

Government Notification No. 17 of 1932.—Regulations for the award of Student Scholarships of the Mauritius College of Agriculture.

Government Notification No. 20 of 1932.—Regulations made under the Tobacco Production and Marketing Ordinance 1930 as amended by the Tobacco Production and Marketing (Amendment) Ordinance, 1931.

Government Notice No. 151 of 1932.—Regulations made by the Governor in Executive Council under Article 16 of the Animal Diseases (Consolidation) Ordinance, 1925, as amended by Article 2 of the Animal Diseases (Amendment) Ordinance, 1930.

Proclamation No. 5 of 1932.—To prohibit the capture, possession in cages or in any other container and the distribution of certain beneficial insects.

Proclamation No. 6 of 1932.—To amend Proclamation No. 7 of 1931. (To declare a certain area infected with a plant disease).

Proclamation No. 25 of 1932.—To amend Proclamation No. 40 of 1928 (Prohibiting the importation of certain articles and imposed conditions with regard to the importation of certain other articles.)

Board of Agriculture, Members of :

The Board of Agriculture established under Ordinance 30 of 1912 consists of :—

His Excellency the Governor—*President*

The Director of Agriculture—*Vice-President.*

The following members were appointed for 1932 :—

The Hon. M. Martin, C.B.E.	L. H. de Froberville Esquire,
„ J. Leclezio	H. G. Ducray Esquire,
„ P. Montocchio	Gabriel Regnard Esquire,
„ R. Gujadhur	Georges Mayer Esquire,
Louis Espitalier Noël Esquire,	Pundit Boleram Esquire,
Captain H. G. Hitchcock M.B.E.	Pierre de Sornay Esquire,
J. A. Duclos Esquire, K.C., C.M.G.	F. A. Nichols Esquire,
G. Clarenc Esquire,	H. Lincoln Esquire,
G. Antelme Esquire,	J. de Spéville Esquire,

There was no meeting of the Board in 1932.

Publications.

The following publications were issued during the year :—

Bulletins.—(a) L'Elevage Bovin à Maurice.

(b). (1). Results of the Nitrogen Manurial Experiments, First Series, harvested 1931.

(2). Results of variety field trials, First Series, harvested 1931 (from Sugarcane Research Station).

Reports.—(*a*) Annual Report of the Department of Agriculture for 1931.

(*b*) Second Annual Report of the Sugarcane Research Station for the year 1931.

(*c*) Report on the working of the Co-operative Credit Societies for the year ended 30th June, 1932.

(*d*) Report on the operations for the control of Phytalus Smithi during the season 1931–32

(*e*) Fifth Progress Report of the Sugarcane Research Station for the period January to June, 1932.

(*f*) Final compilation of sugar production for the 1931 sugar campaign.

(*g*) Preliminary forecast of sugar production for the 1932 sugar campaign.

(*h*) Revised forecast of sugar production for the 1932 sugar campaign.

(*i*) Preliminary compilation of sugar production for the 1932 sugar campaign.

(*j*) Report on an entomological mission in Madagascar by A. Moutia.

The following articles from officers of this Department were published in the Revue Agricole : —

1. "Effet sur la récolte sucrière du cyclone des 5—7 Mars 1931" par M. Kœnig, Statistician.
2. "Notes sur le rendement en cannes et le Phytalus" par A. Glendon Hill, Senior Geneticist.
3. "Résultats des expériences de fumures avec les engrais azotés par N. Craig, Bio Chemist.
4. "Le Riz" par A. Glendon Hill, Senior Geneticist.
5. "Summary of cane variety yield trials, 1931, Sugarcane Research Station" par A. Glendon Hill, Senior Geneticist.
6. "Contrôle Mutuel—Coupe 1931" par L. Baissac, Sugar Technologist.
7. "Influence du poids des cannes sur le ligneux % cannes" par L. Baissac, Sugar Technologist.
8. "Quelques mots sur le pH en sucrerie de cannes à Maurice" par L. Baissac.
9. "Putting Research into Practice" par N. Craig, Bio Chemist.
10. "Population of Mauritius" par M. Kœnig, Statistician.

General.

The Director of Agriculture served as a nominated member of the Council of Government. He also acted as Chairman of the Agricultural College Board, the Government Tobacco Board, the Phytalus Advisory Committee, the Exhibition Committee, the Registration of Agricultural Chemists Committee, the Allotments' Organisation Committee, the Emigration of Labour Committee, the Pineapple Committee and also served on the following Boards and Committees:—the Board of the Mauritius Institute, the Forest Board, the Mauritius Hemp Producers' Syndicate (Executive Committee), the Stock Breeders' Association, the Finance Committee and the Advisory Board of the Mauritius General Improvement and Development Fund.

CANE DISEASE SURVEY 1932

District	White Tanna				D. K. 74				M. 55				M. 131				D. 109				R. P. 8			
	% canes				% canes				% canes				% canes				% canes				% canes			
	Exuding gum	Not exuding gum	With stem deterioration	With Red Rot	Exuding gum	Not exuding gum	With stem deterioration	With Red Rot	Exuding gum	Not exuding gum	With stem deterioration	With Red Rot	Exuding gum	Not exuding gum	With stem deterioration	With Red Rot	Exuding gum	Not exuding gum	With stem deterioration	With Red Rot	Exuding gum	Not exuding gum	With stem deterioration	With Red Rot
Pamplemousses	1	5	56	1	3	1	5	9	1	0	2	9	7	1	1	9	3	0	3	15	1	2	1	5
Rivière du Rempart	1	5	57	6	3	0	1	24	...	...	...	...	...	...	...	...	1	1	4	17	0	2	2	3
Flacq	10	10	49	4	5	2	3	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Black River	3	8	53	3	2	0	3	5	29	1	2	3	9	0	2	3	...	...	...	...	...	...	...	...
Grand Port	9	11	56	3	...	...	...	...	...	...	...	...	7	2	2	4	...	...	...	...	...	...	...	...
Savanne	10	7	52	4	1	2	2	4	6	0	1	2	7	1	0	2	1	2	4	2	...	...	...	...
Moka	6	9	44	4	...	...	...	...	20	2	0	3	...	...	...	...	...	...	...	...	...	...	...	...
Plaines Wilhems	8	10	32	5	3	1	3	8	12	0	8	4	...	...	...	...	...	...	...	...	...	...	...	...
Mean	7	8	52	4	3	1	3	8	12	1	3	5	7	1	1	6	2	1	3	15	1	2	2	3

DISTRIBUTION OF SUGAR CANE DISEASES IN 1932

District	Pineapple disease (*Thielaviopsis paradoxa*)	Smut (*Ustilago sclamined*)	Fourth disease (cause unknown)	Pokkah boeng (*Fusarium sp.*)	Streak (virus)	Stem galls (cause unknown)	Eyespot (*Helminthosporium sp.*)	Brown spot (*Cercospora longipes*)	Bunch top (cause unknown)	Root disease
Riv. du Rempart ...	..	Two estates (on M. 55, W. T. & R. P. 8)	...	...	One estate (on R.P. 8)	...	One estate (on D. 109)	...	...	...
Pamplemousses ...	...	...	...	...	...	...	...	...	...	One estate (on R. P. 8, M. 55 & M. 252)
Flacq ...	...	One estate (On W.T.)	One estate (On W. T.)	...	...	...	...	...	...	One estate (On R. P. 6 & W. T.)
Black River ...	...	...	Three estates (On D. K. 74, M. 55 & a few other undetermined varieties)	One estate (variety unknown).	...	..	One estate (On W.T.)	...	...	...
Grand Port ...	Two estates (On D. K. 74. M. 55, & W. T.)	...	Two estates (On P.O.J. 213, & W.T.)	One estate (On W. T.)	...	One estate (On R. P. 8.).	Two estates (On W. T.)	Two estates (On P. O, J. 213, & M. 131)	One estate (On W. T.)	..
Savanne ...	...	One estate (On W. T.)	...	...	...	One estate (On R. P. 8.).	One estate (On M. 131 & W. T.)	One estate (On M. 55 & W. T).	One estate (On W. T).	...
Moka ..	...	One estate (variety unknown)	Two estates (On D.K. 74 & W. T.)	...	...	One estate (Unknown seedlings)	Two estates (On M. 55 & W.T).	One estate (On W.T.)	One estate (On W. T. & D.K.74).	...
Plaines Wilhems...	One estate (On D. k. 74)	..	One estate (On 55/1182, D. K. 74 & W.T.)	Two estates (On M. 55 & a few other undetermined varieties)	...	One estate (On P.O.J. 2878).		One estate (On W. T. & M. 55.).	...	...

Controle Mutuel—Crop 1932.—Department of Agriculture

Name of Mills and Reference Number	Cane		1st mill juice		Mixed juice				SO_2 per litre sulphured juice	Last mill juice		Gravity purity clarified juice	Dilution % normal juice (weight)	Bagasse					Filter press cake		Reference Number	Syrup		Mill work		Sugar and Recoveries												Molasses			Undiluted juice in bagasse % cane	Milling loss	Number of Rollers	Cane Knives	Average working hours per day	Reference Number
	Sucrose %	Fibre %	Brix	Gravity purity	Brix	Glucose ratio	Gravity purity	Weight % cane		Brix	Gravity purity			Sucrose %	Moisture %	Fibre %	Sucrose % Cane	% Cane	Sucrose %	% Cane		Brix	Gravity purity	Normal juice% cane	Extraction	White sugar % cane	Raw sugar % cane	Low grade sugars % cane	Total commercial sugars % cane	Total in sucrose % cane	Average pol. of all sugars	Sucrose recovery	Over all sucrose recovery	Sucrose lost in manufacture % cane	Total sucrose lost % cane	Weight % cane	Gravity purity	Lely Factor						
									Gr.																																		
7. Mon Désert(1) ...	13.79	11.7	19.1	86.9	14.5	2.9	85.7	106.2	0.69	5.3	72.4	84.8	27.5	2 59	46.2	50.3	0.58	23.3	7.8	2.11	7.	57.9	84.9	83.3	95.8	0.00	11.73	0.05	11.78	11.61	98.6	89.1	85.4	1.60	2.18	3.05	40.3	30.1	36.0	5.0	14	oui	18.2	7
38. The Mount ...	13.72	10.8	19.3	87.4	15.9	4.7	85.3	96.5	0.86	5.3	78.2	...	19.4	3.22	...	...	0.73	22.8	—	...	38.	...	...	80.2	94.7	0.01	11.35	0.05	11 41	11.25	98.6	87.8	83.1	1.74	2.47	...	...	...	...	...	11	oui	16.2	38
22. Savannah ...	13.69	11.9	19.2	86.5	15.0	4.3	84.1	102.8	0.88	4.3	76.3	83.6	27.5	3.10	45.7	50.2	0.74	23.8	8.9	1.70	22.	55.6	83.8	80.7	94.6	0.75	10.80	0.00	11.55	11.38	98.6	89.2	84.3	1.57	2.31	...	40.7	37.1	42.5	6.2	11	non	14.7	22
37. Beau Plan(1) ...	13.63	12.8	19.1	87.8	15.1	2.7	87.8	99.7	0.60	4.5	77.5	83.8	25.0	2.89	44 3	52.0	0.71	24.6	7.9	...	37.	53.1	83.4	79.4	94.7	1.20	10.20	0.00	11.40	11.21	98.3	88.2	83.6	1.71	2.42	...	40.9	33.1	37.4	5.6	11	non	16.5	37
8. Alma(1) ...	13.57	12.4	18 7	89.7	14.8	2.8	87.0	100.3	0.43	3.5	79.0	87.1	24.9	2 65	15.2	51.4	0.64	24.2	7.3	...	8.	54 1	87.5	80.3	95.3	0.20	11.73	0,00	11.93	11.74	98.4	92.2	87 9	1.19	1.83	...	38.4	30.7	34.9	5.2	12	2	20.3	8
3. Highlands(1) ...	13.56	10.6	18.8	89.3	14.8	3.1	85.5	102.7	0.62	3.8	74.0	85.8	22 8	2.85	45.4	50.8	0.59	20.8	8.5	1.98	3.	60.0	86.9	83.7	95.6	0.00	11.55	0.00	11.55	11.40	98.7	89.0	85.1	1.57	2.16	...	42.4	33 4	40.2	5.6	11	oui	17.5	3
13. Trianon ...	13.50	14.1	19.1	89.2	14.7	2.3	86.6	99.2	0 42	5.1	81.9	86.7	27.7	3.05	43.5	52.7	0.80	26.8	7.6	1.45	13.	54.1	86.8	77.7	94.1	0.00	11.29	0.23	11.52	11.31	98.2	90.7	85.3	1.39	2.19	...	40.3	32.4	38.1	5.8	9	non	18.2	13
27. Mon Loisir ...	13.49	12.4	18 9	86.7	15.6	4.3	84.3	96.6	.	4.2	74.8	...	20.0	2.98	44.9	51.1	0.72	24.2	6.6	...	27.	55.2	...	80.3	94.7	0,25	10.47	0.28	11.00	10.82	98.4	86.2	81 6	1.95	2.67	...	39.8	35.6	41.4	5.8	14	non	15.4	27
1. Britannia(1) ...	13.44	12.9	19.0	89.0	14.5	3 5	86.4	101 9	0.55	3.7	73.4	86.3	27.4	2.69	43.3	52.9	0.66	24.4	8.4	...	1.	61.5	85.6	80.1	95.0	0.00	11.63	0,00	11.63	11.47	98.6	91.0	86.5	1.31	1.97	...	40.6	30.1	37.8	5.1	11	oui	18.8	1
33 Labourdonnais(1) ...	13.37	13.3	19.2	87.7	15.5	3.0	86.0	94.5	0.75	3.8	78.4	85.5	21.1	2.68	45.9	50.2	0.71	26.5	10.0	2.24	33.	55.8	85.1	78.0	94.7	0 00	11.07	0 0	11.07	10 89	98.4	87.4	82.8	1.77	2.48	...	40.6	31.6	40.7	5,3	11	oui	18.4	33
21. Terracine ...	13.34	12.3	19.0	87.6	15.1	3.5	83.9	100.2	0.51	4.3	77.3	83.7	23.4	2.78	13.4	53.0	0.64	23.3	9.0	...	21.	58.5	84.0	81.2	95.2	0.00	11.34	0.00	11.34	11.17	98.5	89.3	85.0	1 53	2.17	...	39.0	29.8	35.7	5.2	11	non	12.8	21
32.	13.31	11.7	19.1	85.9	15.7	4.1	82.9	96.9	0.65	4.6	75.5	83.8	20.1	3.09	46.0	50.0	0.72	23.3	8.6	...	32.	53.2	84.0	80.6	94.4	0.00	11 00	0.00	11.00	10.78	98.0	87.4	82.6	1.81	2.53	...	...	37.7	41 9	6.2	12	oui	20.0	32
10.(1)	13.18	12.8	18.7	86.0	14.7	4.9	83.6	97.1	0.48	2.8	72.0	84.2	25.3	2.11	43.5	53.1	0.58	24.1	8.4	...	10.	58.6	84.6	81.9	95 6	1.40	9.56	0.00	11.41	11.25	98.6	90.5	86.6	1.35	1.93	...	38 8	26.2	33.7	4.5	14	oui	19 0	10
5. Rose Belle(1) ...	13.16	13.9	18.9	88.5	15.5	3.1	86.1	100.4	0.41	3.7	76.4	86.2	37.7	1.94	43.6	53.8	0.50	25.9	6.9	...	5.	53.0	87.0	78.6	96.2	0.00	11.45	0.08	11.53	11.37	98.6	91.1	87.6	1.29	1.79	...	39.5	21.5	24.7	3.6	11	non	20.7	5
17. Côte d'Or ...	13.16	13 1	18.6	87.8	14.6	3.3	85 0	99.5	1.00	4.6	80.8	85.1	26.7	3.07	45 6	50.6	0.79	26.0	8.0	...	17.	51.6	86.6	78.5	94.0	10.50	0.00	0.10	10.60	10.58	99.8	85 7	80.5	1.79	2.58	...	42 3	37.2	40.4	6.1	11	non	13.6	17
9. Sans Souci(1) ...	13.15	11.7	18.4	87.8	14.3	4 6	85.0	101.9	0 00	2.9	72.0	85.8	25.4	2.83	45.4	50.6	0.65	23.0	8.1	1.45	9.	57.1	85.1	81.3	95.0	0.47	10.71	0.04	11.22	11.07	98.7	89.8	85,3	1.43	2.08	3.36	40.3	34.5	42.2	5.6	14	non	22,1	9
18. Argy	13.15	13.2	18.7	85.9	15.1	5.0	84.3	96.9	0 00	5.3	75.6	84.7	21.8	3.18	43.8	53.7	0 78	24.7	7.5	...	18.	50.6	84.4	78.8	94.0	0.20	10.62	0 13	10.95	10.76	98.3	88.5	83.2	1.61	2.39	...	38.9	34.2	24.9	5.9	11	non	15.2	18
30. Deux Bras ...	13.07	14.8	18.9	86.9	15 1	3.6	84.8	94.9	0.00	5.4	76.4	85.7	26.2	2.94	45.1	51.0	0.85	29.0	6.1	...	30.	53.7	85.2	75.5	93.3	0 00	10.80	0,00	10.80	10.64	98 6	88.3	82.5	1.58	2.43	...	44.2	35.1	39.8	5.1	9	oui	15.0	30
25. St. Antoine ...	13.04	14.1	19.3	86.0	15.8	4.5	82.6	91.8	1.04	5.9	75.4	83.3	19.9	3.80	44.6	50.4	1.06	27.0	9.5	..	35.	55.6	86.5	76.6	91.9	10.34	0.21	0.00	10.55	10.50	99.6	88.0	80.9	1.48	2.54	...	40.0	45 5	51.8	7.5	11	non	23.3	35
20. Union... ...	13.04	12.9	18.5	87.4	14.6	3.6	84.6	101.6	0.21	5.2	78.5	85.1	25.4	2.42	42.8	54.1	0.57	23.8	7.5	...	20.	53.5	85.4	80.6	95.6	0.00	11.04	0 00	11.04	10.87	98.5	88.5	84,7	1.60	2.17	...	40.2	27.6	30.8	4.5	9	non	14.7	20
31. Belle Vue ...	13.02	14.0	18.7	86.9	15.7	3 9	84.3	91.0	0.85	5.8	78.7	84.0	17.4	3.23	44.2	51.7	0.86	26.5	9.0	...	31.	45.0	82.8	77.5	93.4	1.03	9.72	0.00	10.75	10.57	98.3	88.3	82.5	1.59	2.45	...	40.2	38.3	42.0	6.2	11	non	14,6	31
41. Riv. des Anguilles...	13.02	13.0	17.4	86.9	15.3	...	83.4	91.9	...	5.8	78.1	84.1	18.6	3.88	45.8	49.2	1.02	26.4	8.8	...	41.	49.6	85.3	78.1	92.2	0.18	10.17	0.15	10.50	10.31	98.3	87.5	80.6	1 69	2.71	..	47.5	57.6	57,6	7.8	9	non	13.3	41
23. St. Félix ...	13.01	11.3	18.3	87.7	14.5	3.4	85.0	100.0	0.43	3.7	80.7	85.3	23.2	2.91	46.8	49.6	0.66	22.9	8.6	...	23.	53.7	84 5	81.6	94.9	0 00	10.99	0.01	11.00	10.82	98.4	89.0	84.5	1.53	2.19	...	40.1	36.5	39.7	5.9	12	oui	14.9	23
4. Beau Champ(1) ...	12.95	12.6	18 2	87.6	14.1	3.8	84.4	102.6	(2)0.04	3.9	71.2	84.6	27.9	2.93	43.9	52.0	0.71	24.2	8.6	...	4.	57.2	84 8	80.2	94.5	0.00	11.07	0,00	11.07	10.93	98.8	90.4	85.5	1.31	2.02	...	39.8	35.3	43.4	5.6	11	non	18.8	4
15. Bel Ombre ...	12.91	11 7	18.2	87.0	14.2	4.6	84.2	102 0	0.40	4.6	70.7	84.5	25.6	2.99	45.1	50.7	0.68	23.0	7.9	...	15.	59.4	84 8	81.5	94.7	0.00	10.79	0,01	10.80	10.63	98.4	88.3	83.6	1.60	2.28	...	38.3	37.3	45.7	5.9	9	oui	12.9	15
14. Réunion ...	12.83	12.8	18.1	87.1	14.3	3.7	84.7	100.9	0 00	3.1	83.0	85.6	25.0	2.45	42.8	53.8	0.58	23.8	7.6	1.92	14.	58.9	85.1	80 7	95 5	0.00	11.08	0,02	11.14	10.98	98.6	90.9	86.8	1.27	1.85	...	40.0	28,8	38.2	4.6	12	non	12.3	14
12. La Baraque ...	12.81	12.6	18.8	86.8	15.0	5.5	82.5	97 9	0.74	4.5	73.7	82.8	22.4	2.79	44.6	51.7	0.68	24.5	7.5	...	12.	51.8	83.9	80.0	94.6	0.77	9.89	0.06	10.71	10.58	98.8	88.2	83.6	1.55	2.33	...	39.9	30.6	35,3	5,4	12	oui	13.3	12
28. Beau Vallon ...	12.80	14.6	19.7	85.9	15.8	4.0	83.0	93.0	0.00	5.1	75.9	83.1	24.1	2.77	43.2	53.1	0.76	27.6	5.7	...	28.	46.7	83.1	74.4	94.0	0.00	10.88	0 00	10.88	10.72	98.5	90.3	85.0	1.32	2.08	...	37.8	28.5	35.2	5.2	...	oui	17.8	28
24.	12.80	14.1	19.1	85.9	15.3	4.6	81.2	95.0	1.10	5.2	76.1	82.3	24.0	3.36	44.8	50.7	0.94	27.8	7.8	...	24.	51.1	83.1	76.7	92.7	9.12	1.21	0.00	10.33	10.29	99.6	86.1	80.7	1.37	2.51	...	37.6	40.4	46.4	6.6	...	non	11.7	24
11. Queen Victoria(1) ...	12.78	12.0	18.2	86.6	14.5	4.4	83.6	94.2	0.58	4 8	75 3	84.3	24.1	2.91	46.9	49.2	0.71	24.4	7.8	...	11.	52.5	84.7	80.1	94.4	1 03	9.77	0.09	10.89	10.72	98.4	90 2	80 2	1.35	2.06	...	39.7	37.4	43 0	5.9	11	non	18.2	11
2. Beau Séjour(1) ..	12.76	13.6	18.8	87.5	14.5	6.1	83.9	100.8	0.50	4.1	67.7	84.6	27.2	2.14	43.6	53.2	0.55	25.6	7.5	...	2.	57.3	84.3	79.2	95 7	0.00	10.78	0.00	10.78	10.64	98.7	88.3	84.5	1.57	2.12	...	37.9	24.4	31.5	4.0	11	oui	15.2	2
16. Gros Bois ...	12.76	13.3	20.2	84.8	14 8	4.0	82.9	98.4	0.78	4.4	78.2	83.2	25.3	2.67	45.0	51.1	0.69	26.0	7.0	...	16.	55.0	83.2	78.5	94.6	0.00	11.18	0.00	11.18	11.00	98.4	91.0	86.1	1.07	1.76	...	42.5	32.9	37 8	5.2	9	oui	18.0	16
40. Deep River ...	12.76	12.4	18.2	85.9	14.2	4.3	84.0	100.7	0.00	3.7	73.0	84.0	26.2	2 98	45.4	50.5	0.73	24.6	7.6	2.34	40	53.1	84.0	79.9	94.2	0.00	10.82	0.01	10.83	10 67	98.5	90.0	84.9	1.36	2.09	...	41.2	37,8	44.4	5,9	11	oui	19.0	40
25. Bénarès ...	12.69	13.3	18.2	85 3	14.5	4.3	83.1	98.7	0.39	3.3	74.0	83.1	22.2	2.51	40.7	56.0	0.59	23.8	7.9	...	25.	50.2	82.6	80.7	95.3	0.00	10.59	0.01	10.60	10.47	98 8	87.6	83.5	1.63	2.22	..	...	37.0	44.5	6.2	11	non	17.0	25
29. Riche-en-Eau ...	12.69	13.4	18.5	85.7	13.6	4.6	84.0	104 8	0.14	3.6	75.4	84.2	34.7	2.97	46.2	50.0	0.79	26.8	7.6	...	29.	58.8	84.4	77.7	93.8	0.00	10.67	0.00	10.67	10.50	98.4	89.7	84.1	1.40	2.19	...	42.3	37.6	41.4	5.9	11	oui	13.8	29
42. Valona ...	12.69	12.9	18.3	85.3	14.6	5.3	82,8	99.5	0.42	4.8	73.8	83.0	24 4	2.85	43.9	52.2	0.70	24.7	8.4	...	42	54.9	83.0	79.9	94.5	0.28	10.55	0.03	10.86	10.67	98.3	90.6	85.0	1.32	2.02	...	39.9	35.0	40.8	5.5	9	oui	13.7	42
39. Antoinette ...	12.66	13.5	18.3	85.5	15.6	5.7	83.8	92.9	0.66	4.7	74 0	84 0	18.3	2.22	44.9	52.1	0.58	26.0	7.3	...	39.	52.6	84.4	78.5	95.4	0.42	10.44	0.02	10.88	10.73	98.6	90.0	86.0	1.35	1.93	...	39.0	27.3	31.9	4.3	12	oui	13.8	39
6. Mon Trésor(1) ...	12.58	13.9	18.9	86.2	13 5	5.4	83.9	106.2	0.21	3.7	73.6	84.2	38.0	2.30	45.9	51.0	0.62	27.3	7.4	...	6.	57.8	84.2	77 2	95.1	0.00	10.67	0.00	10.67	10.52	98.6	89.2	84.8	1.44	2.06	...	40.0	25.8	32.2	4.5	9	oui	...	6
34. Union Flacq ...	12 52	12 9	18.2	85.3	15.2	5.6	82.1	94.4	0.60	4.0	71.9	83.4	18.7	2.80	44.3	51.7	0.70	24.9	7.3	...	34.	59.8	83.7	79.6	94 4	3.25	7.35	0.06	10.66	10.51	98.6	90.2	85.2	1.31	2.01	...	...	35.0	42.5	5.4	14	non	15.6	19
19. St. Aubin ...	12.50	11.8	18.0	87.0	14.2	4.2	84 3	96.5	0.50	8.4	77,9	83.4	23.0	4.19	46.5	48.1	1.03	24.6	8.0	...	19.	60.8	83.5	78.4	91.8	0.02	10.19	0,24	10.45	10.31	98.7	90.5	83,1	1.16	2.19	...	...	55.5	62.1	8.7	8	non	15.4	34
36. Médine(1) ...	12.42	14.0	18.4	84.9	15.5	6.2	82.1	91.3	0.97	3.9	75.3	82.8	18.9	2.78	44.6	51.2	0.76	27.3	9.0	...	36.	58.2	84.1	76.8	93 9	9.22	0.95	0.00	10.17	10.12	98.5	87.2	81.9	1.51	2.30	3.40	36.8	34.8	44.6	5.4	16	oui	21.6	36
26. Le Vallon ...	12.20	14.2	18.5	83.2	15 9	4.7	80.8	88.0	0.60	5.8	72.7	80.4	15.2	3.13	45.1	50.6	0.87	28.1	8.2	...	26.	48.0	80.9	76.4	92.9	0.30	9.83	0.10	10.23	10.06	98.3	90 3	83.8	1.27	2.14	...	40.9	40.2	46.0	6,2	12	non	9.8	26
Arithmetical mean ...	13.04	12.9	18.7	86.8	14.9	4.2	84 3	98.2	0.51	4.5	75.4	84.3	24.0	2.88	44.7	51.5	0.72	25.1	7.9	1 90		54.9	84 4	79 3	94.5	1.21	9.74	0.04	10.99	10.83	98.6	89.1	84.2	1 49	2.21	3.27	39.5	34.5	39.5	5.6	...	...	...	...
True mean ...	13.06	...	...	...	...	...	...	...	...	...	...	...	...	2.84	...	...	0.71	24.9	...	...		...	...	...	94.5	1.30	9.63	0.08	11.01	10.86	98.6	89.1	84.3	1.49	2.20	...	...	...	...	...	..	...	...	...

(1) Clerget figures.

(2) Phosphoric acid

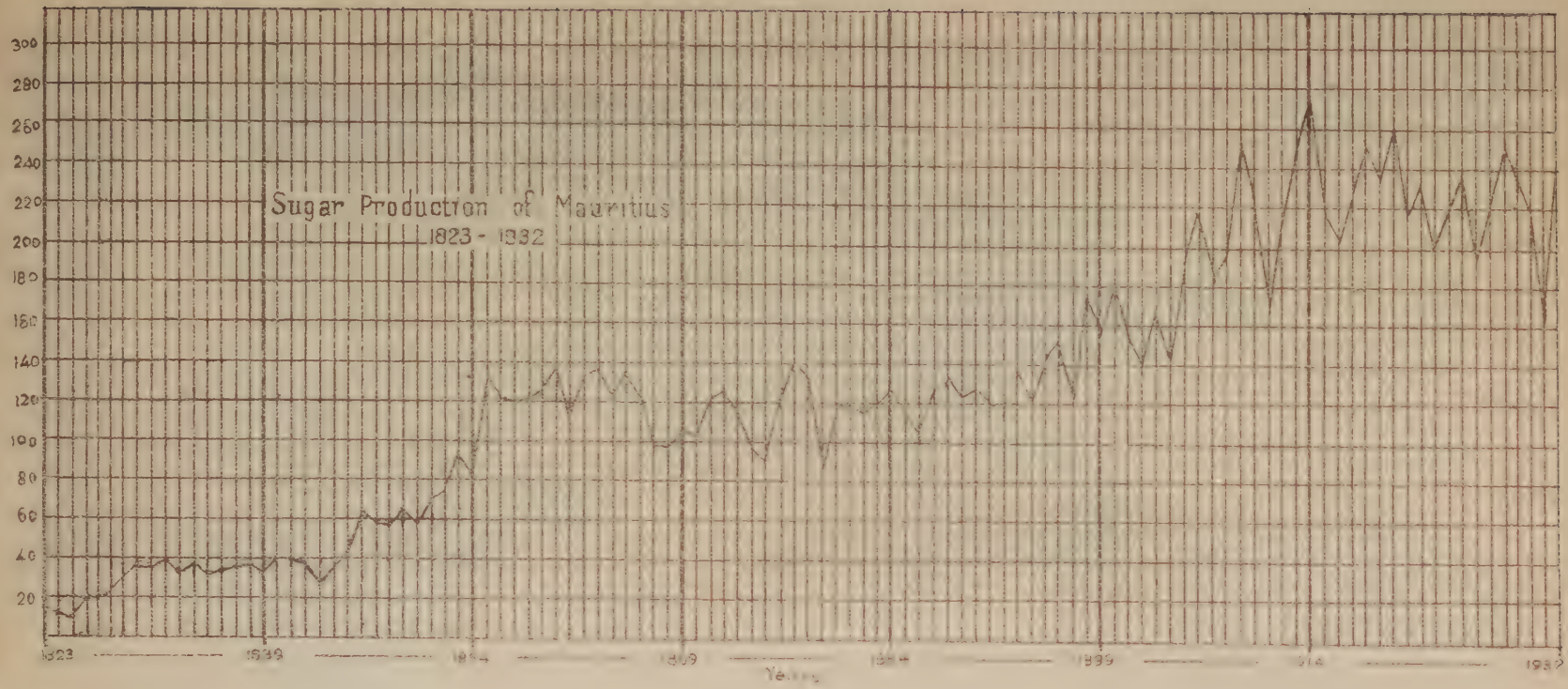
YEARLY VALUE OF IMPORTS OF TOBACCO
1925–1931

MEAN MONTHLY RESULTS OF METEOROLOGICAL OBSERVATIONS TAKEN AT THE STATIONS UNDER THE CONTROL OF THE DEPARTMENT OF AGRICULTURE, MAURITIUS.

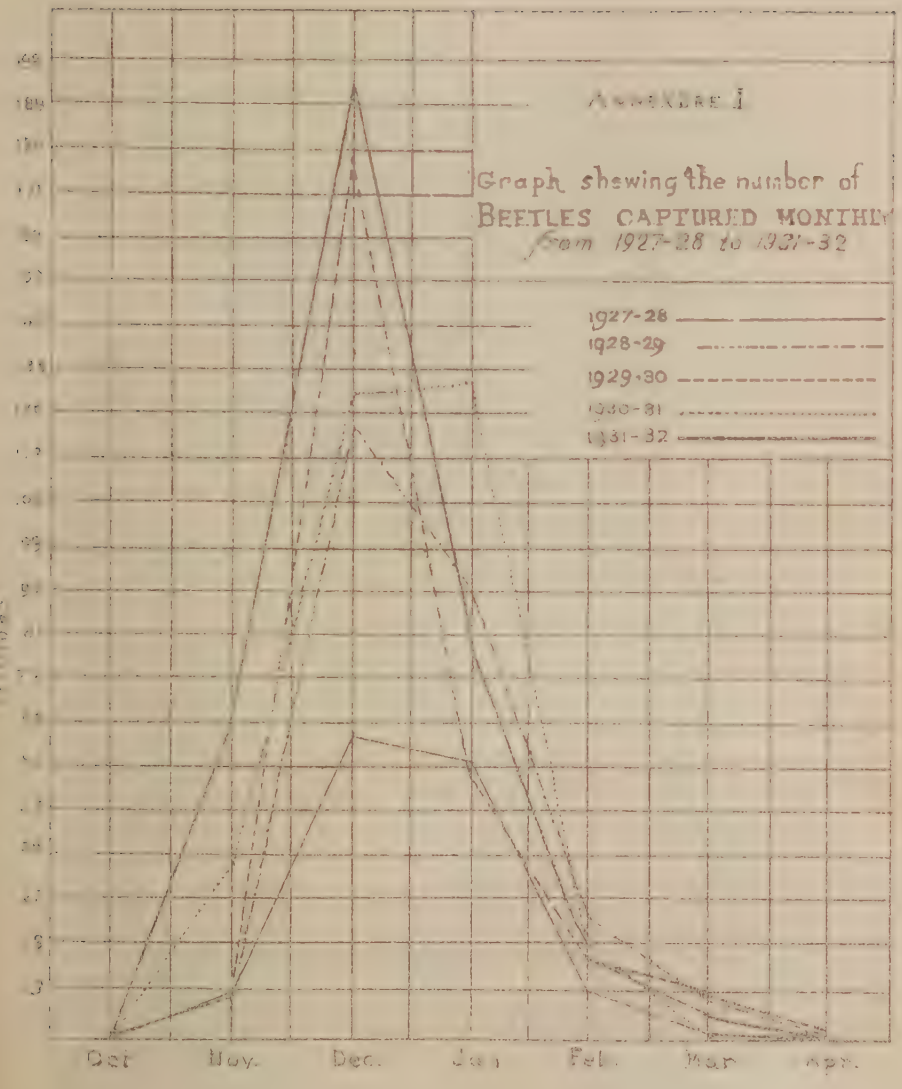
Stations	Central Experiment Station, Réduit							Botanical Gardens, Curepipe					Barkly Nursery, Beau Bassin					Abercrombie Nursery, Port Louis				Royal Botanical Gardens Pamplemousses	
Elements	Air Temperature			Relative Humidity	Rainfall		Sunshine	Air Temperature		Relative Humidity	Rainfall		Air Temperature		Relative Humidity	Rainfall		Air Temperature		Rainfall		Rainfall	
Months 1932	Min. °C	Max. °C	Mean C	%	Depth of rain mm.	No. of days	Hours	Min °C	Max. C	%	Depth of rain mm.	No. of days	Min. C	Max °C	%	Depth of rain mm.	No. of days	Min C	Max. C	Depth of rain mm.	No. of days	Depth of rain mm.	No. of days
January ...	21.4	28.5	24.3	76.2	210.7	23	221.95	54.4	20.1	24.3	84.5	273.5	26	20.8	29.7	69.2	221.5	17	23.3	31.4	179.9	10	253.5	19
February ...	21.0	27.9	23.9	77.5	396.6	29	177.27	48.0	20.2	23.5	90.9	595.5	29	19.7	29.4	74.3	254.5	16	22.9	30.3	278.5	15	345.2	17
March ...	21.5	28.4	24.3	78.3	339.4	27	191.83	50.9	20.8	24.1	90.3	427.5	29	21.3	30.5	78.9	269.9	21	23.5	30.9	246.1	17	261.2	20
April ..	20.3	26.0	22.5	78.6	265.5	21	200.55	57.7	18.9	22.2	86.9	879.2	28	21.3	28.0	78.5	262.9	16	22.1	29.6	265.2	17	309.0	21
May ...	16.4	24.0	19.9	76.7	110.3	24	252.53	73.2	16.5	19.9	85.4	239.5	26	20.1	27.3	71.0	74.8	14	19.5	26.9	97.8	15	144.3	16
June ...	15.2	22.8	18.6	78.3	167.6	24	200.95	61.5	14.5	18.5	88.7	359.7	28	18.9	26.3	77.2	161.9	9	17.8	25.7	131.3	15	293.2	22
July ..	15.4	22.4	18.1	76.9	43.3	22	228.80	67.1	14.8	18.0	87.8	165.0	29	19.6	26.5	81.0	21.8	15	18.2	25.5	16.6	11	35.5	20
August ...	15.0	22.8	18.4	74.8	41.2	24	236.85	67.1	13.8	18.1	88.7	200.8	25	18.7	26.8	84.4	26.7	8	19.5	25.9	34.5	13	39.5	17
September ...	15.7	23.0	18.7	70.5	50.3	22	243.46	67.9	14.7	18.0	87.5	274.2	29	17.4	27.2	72.5	19.1	12	19.0	26.3	72.4	21	94.5	21
October ..	15.9	24.6	19.7	65.9	43.1	21	258.50	61.5	14.9	19.3	85.1	158.3	26	17.3	26.6	77.3	23.1	4	19.4	27.7	34.8	17	53.0	22
November ..	18.0	27.1	21.9	64.8	27.1	15	267.03	68.4	16.2	22.0*	80.0*	121.0	18	17.2	28.1	65.0	16.3	9	21.7	30.0	26.7	16	50.3	15
December ...	19.2	27.7	22.8	63.3	51.3	14	276.72	67.2	17.5	23.1	74.7	93.5	12	18.4	29.0	61.5	11.8	13	21.9	30.9	38.8	13	59.5	13
Year ...	17.9	25.4	21.1	73.5	1,746.7	266	2,736.40	62.0	16.9	20.9	85.8	3,787.7	305	19.2	27.9	74.2	1,391.4	154	20.8	28.4	1,422.6	174	1,738.7	223
					Total		Total					Total					Total				Total		Total	

REMARKS.—The figures for Relative Humidity are the means of 9h. and 15 h. readings. Temperature figures, at Réduit, are obtained from hourly measurements of thermograms standardised daily at 9 h. and 15 h. At other stations, maximum and minimum thermometers are read daily at 9 h. and 15 h. Rainfall is measured at 9 h. and the amount entered for the day.

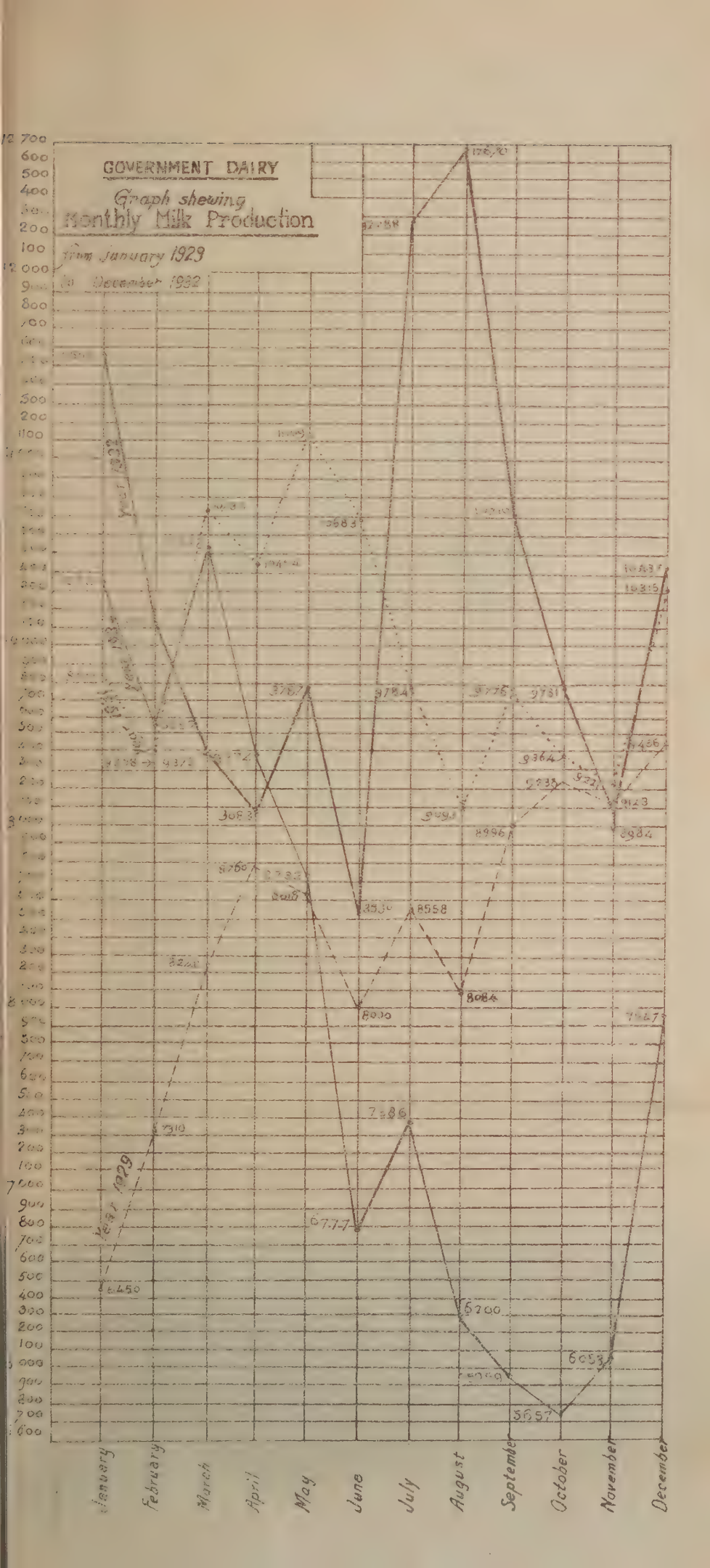
* Uncertain


Sugar Production of Mauritius
1823 - 1932
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
1823
1939
1869
1889
1914
1932
Years

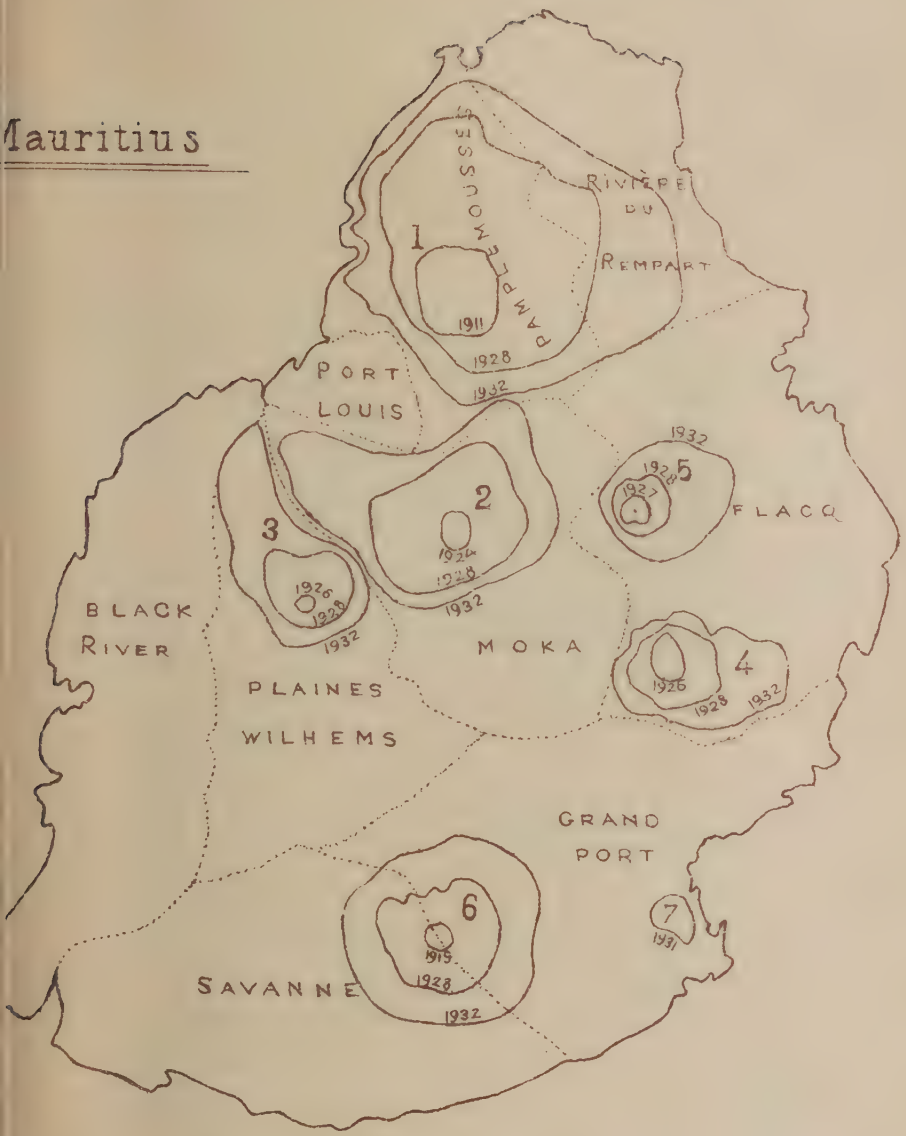
Number of Sugar Factories
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
1821-25
1826-30
1831-35
1836-40
1841-45
1846-50
1851-55
1856-60
1861-65
1866-70
1871-75
1876-80
1881-85
1886-90
1891-95
1896-100
1901-05
1906-10
1911-15
1916-20
1921-25
1926-30
1932


ANNEXURE I
Graph shewing the number of
BEETLES CAPTURED MONTHLY
from 1927-28 to 1931-32
1927-28
1928-29
1929-30
1930-31
1931-32
Oct
Nov.
Dec.
Jan
Feb.
Mar
Apr.

ANNEXURE II
Graph shewing TOTAL NUMBER of PHYTALUS ... and yearly since beginning of campaign ... COST OF OPERATION
Millions Phytalus
Thousand Rupees
408
384
360
336
312
288
264
240
216
192
168
144
120
96
72
48
24
120
108
96
84
72
60
48
36
24
12


GOVERNMENT DAIRY
Graph shewing
Monthly Milk Production
from January 1929
to December 1932
January
February
March
April
May
June
July
August
September
October
November
December

Mauritius



Phytalus infected Areas

Pamplemousses & Rivière du Rempart	*(original Infection,*	*1911)*
Moka	*(" "*	*1924)*
Plaines Wilhems	*(" "*	*1926)*
Flacq, Sébastopol	*(" "*	*1926)*
Flacq, St. Julien	*(" "*	*1927)*
Grand Port, Savanne	*(" "*	*1919)*
Grand Port, Beau-Vallon	*(" "*	*1931)*

%
100
88
80
72
64
56
48
40
32
24
16
8
0
Mean size of Phytalus larvae
in all infested centres
Large Larvae
Medium
Small
January
February
March
April
May
June
July
August
September
October
November
December

Diagram illustrating the annual natural life cycle of Phytalus Smithi, row, as compared with the occurrence of its parasites (Tiphia parallela, Smith, and Elis thoracica, F.); the relative proportion of small, medium and full-sized Phytalus larvae is also shewn.

The letters S.M.L. in the diagram refer to small, medium and large larvae, whilst the figures refer to percentages.